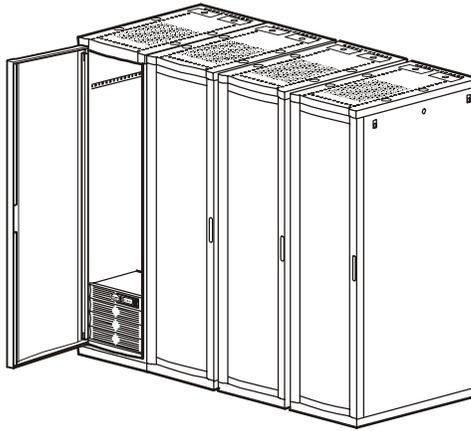


# InfraStruXure™ for Wiring Closets and Computer Rooms: Site Preparation, Site Planning, and Installation

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InfraStruXure for Wiring Closets and Computer Rooms is an integrated power, rack, air, and management system consisting of standard, plug-and-play components. This system installs quickly and enables you to organize and control your IT environment efficiently.



This guide summarizes how to install your InfraStruXure System. For detailed installation, operation, and maintenance instructions, see the documentation included with each component in your system.

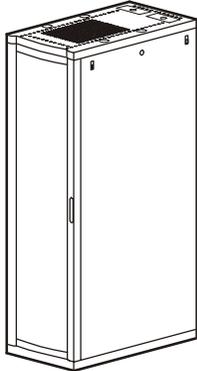
Contact your APC representative or visit the APC Web site ([www.apc.com](http://www.apc.com)) for a complete list of InfraStruXure System options and additional documentation.

Before installing or operating any InfraStruXure System components, read the safety instructions and warnings included in each component's manual.

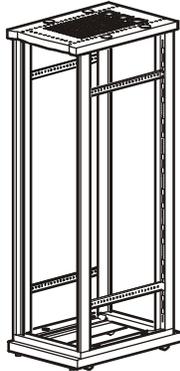
# System Components

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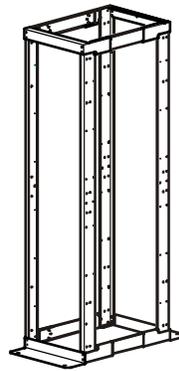
## Rack



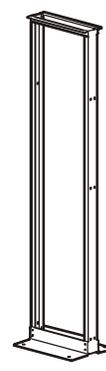
NetShelter<sup>®</sup> VX  
Enclosure



NetShelter VX  
Open Frame

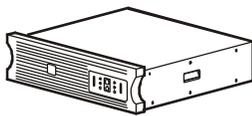


NetShelter  
4-Post Open Frame



NetShelter  
2-Post Open Frame

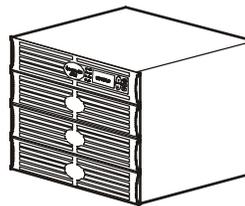
## Power



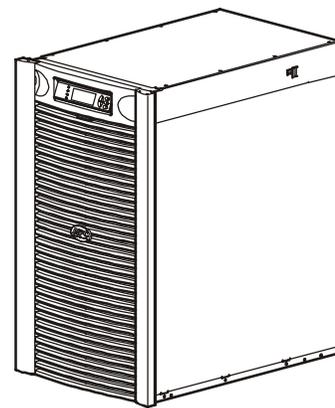
Smart-UPS<sup>®</sup>  
1500 VA, 3000 VA



Smart-UPS RT  
1500 VA, 2400 VA, 5000 VA,  
7500 VA, 10,000 VA



Symmetra<sup>®</sup> RM  
2-6 kVA

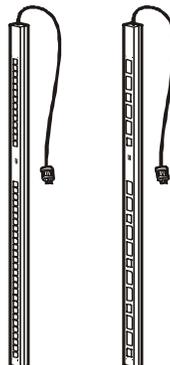


Symmetra LX  
4-8 kVA, 8-16 kVA

## Power distribution



Basic  
Rack PDUs

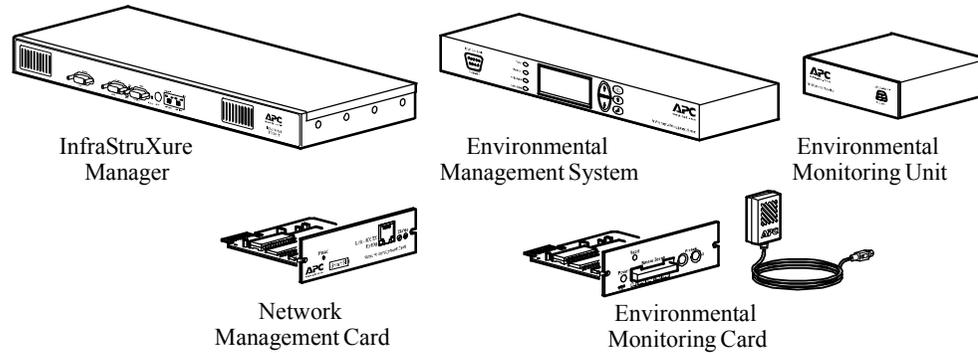


Metered  
Rack PDUs



Switched  
Rack PDUs

## Management



## Rack accessories

The following rack accessories are offered by APC for InfraStruXure Systems:

- Keyboard drawers
- Keyboards
- Rack-mounting hardware
- Rack fan systems
- Security devices
- Shelving
- Stabilization plates and brackets
- Shielding troughs and cable ladders
- Blanking panels
- Grounding kits
- Rack PDU mounting brackets

## Services

The following service packages are offered by APC for InfraStruXure Systems:

- Installation and Start-Up Services
- Pre-Installation Consulting
- Extended Warranties
- On-Site Service
- Preventive Maintenance
- Battery Refresh Programs
- Network Integration for APC Software
- Remote Monitoring Service

# Site Preparation

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## Verify the shipment

Ensure that all labeled pallets and boxes match your purchase order. Do not unpack the pallets and boxes until you are ready to install the system.

## Weight considerations

Ensure that the floor and sub-floor can support the total weight of the system when the weight of the enclosures is concentrated on the leveling feet. If you are placing equipment on a raised floor, consult the flooring manufacturer for loading requirements before installing equipment.

Decide what equipment will be installed in your racks and enclosures. Do not exceed the maximum capacity listed in the table.

Rack or Enclosure	Maximum Capacity
NetShelter VX Enclosure	2000 lb (907 kg)
NetShelter VX Open Frame	2000 lb (907 kg)
NetShelter 4-Post Open Frame	1000 lb (454 kg)
NetShelter 2-Post Open Frame	750 lb (340 kg)

†NetShelter VX Enclosure (AR2145BLK) and NetShelter VX Open Frame (AR2144BLK) are NEBS GR-63-CORE (Seismic Zone 4)

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## Electrical requirements and safety



**Consult your UPS and power distribution manuals for detailed electrical requirements and installation instructions.**

**Consult your national standards for requirements other than those listed in the manual included with your products.**

**The UPS contains internal batteries and may present a shock hazard even when disconnected from the branch circuit (mains). See the safety information in your UPS manual for more information.**

**Electrical input.**

<b>Product</b>	<b>Connection Method</b>	<b>Connection Type</b>	<b>Voltages Supported</b>
Symmetra 2–6 kVA <sup>†</sup>	Hard-wired	3-wire (1PH+1PH+G)	200
	Cord-connected	NEMA L6-30P	
Symmetra LX 4–8 kVA	Hard-wired	50 A, 2-pole (external); 25 mm <sup>2</sup> 4-wire (G+L2+N+L1)	200
Symmetra LX 8–16 kVA	Hard-wired	100 A, 2-pole (external); 25 mm <sup>2</sup> 4-wire (G+L2+N+L1)	200
Smart-UPS 1500	Cord-connected	NEMA 5-15P	100
Smart-UPS 2400	Cord-connected	NEMA L5-30P	100
Smart-UPS 3000	Cord-connected	NEMA L5-30P	100

<sup>†</sup> The specifications apply to units with and without a step-down transformer.

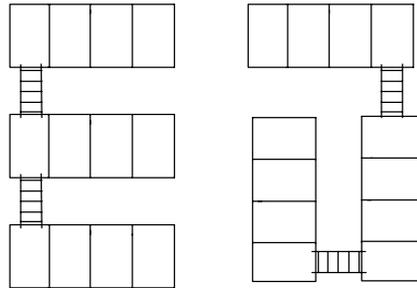
**Electrical output**

<b>Product</b>	<b>Connection Type</b>	<b>Voltages Supported</b>
Symmetra RM 2–6kVA	(2) NEMA L6-20R (1) NEMA L6-30P	200
Symmetra RM 2–6kVA with step-down transformer	(12) NEMA 5-20R (2) NEMA L6-20R	100, 200
Symmetra LX 4–8kVA	(2) L14-30R (4) L5-20R (1) Hard Wire 3-wire (2PH+N+G)	100, 200
Symmetra LX 8–16kVA	(4) L14-30R (8) L5-20R (1) Hard Wire 3-wire (2PH+N+G)	100, 200
Smart-UPS 1500	(6) NEMA 5-15R	100
Smart-UPS 2400	(6) NEMA 5-15R	100
Smart-UPS 3000	(8) NEMA 5-15R	100

## Site planning

Install Cable Ladders to support any of several physical configurations of enclosures. See the specifications for your system for detailed requirements, including minimum clearances and the maximum number of enclosures supported. The following are sample configurations:

- Cable Ladders to span aisles between rows of enclosures



- Cable Ladders to span gaps between sets of enclosures along a single row



# Basic Installation Procedures

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## Unpack racks and enclosures

Unpack the racks and enclosures included with your shipment according to the unpacking instructions in the rack or enclosure manual.



**Note**

Search all boxes and packaging to make sure they are empty.

## Assemble racks and enclosures

Place the racks and enclosures in their proper position at the installation site. “Site planning” on page 6 provides examples of how you might position the racks and enclosures.

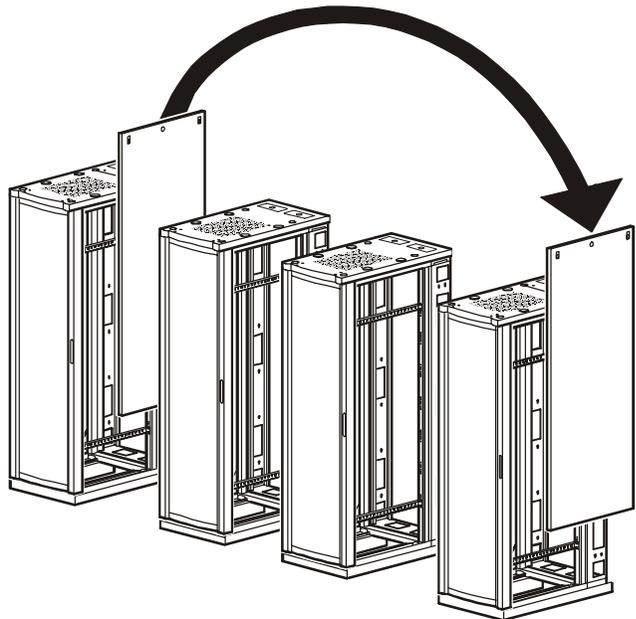
**If you have enclosures as part of your system.** Each row should include one enclosure with side panels. The other enclosures should be expansion enclosures without side panels.

1. Place the enclosure with side panels at the end of the row, and remove the side panel that will be adjacent to an expansion enclosure. Place the side panel that you have removed on the expansion enclosure at the end of the row.
2. Join adjacent enclosures.



**See also**

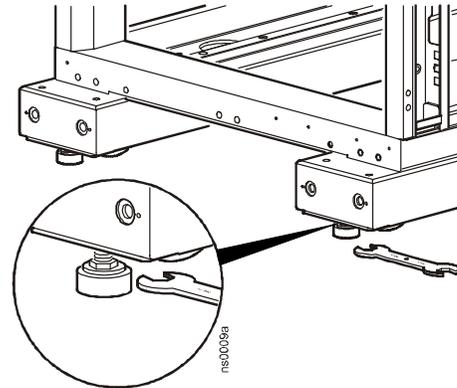
See the manual included with your enclosures for instructions.



### 3. Level the enclosures.

Leveling feet are attached under the enclosure at the corners. The leveling feet can help provide a stable base if the selected floor space is uneven, but cannot compensate for a badly sloped surface. To level the enclosure:

- a. Fit the 14-millimeter end of the open-ended wrench (provided) to the hex head just above the round pad on the bottom of a leveling foot. Turn the wrench clockwise to extend the leveling foot until it makes firm contact with the floor.
- b. Repeat step a for each of the remaining leveling feet.
- c. Use a level to determine which feet need further adjustment to level the enclosure.



### Install the UPS



See also

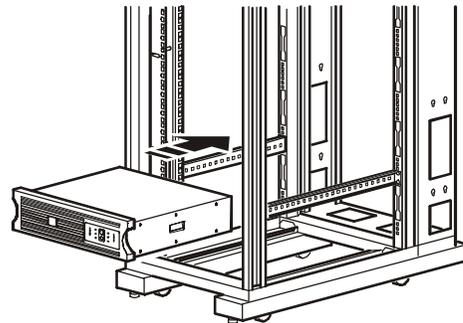
Follow the installation procedures in the manual included with your UPS.



Heavy

Use two people to install the UPS.

Install the UPS in the bottom of the selected rack or enclosure. (See “Site planning” on page 6 for suggestions.) If you have a Symmetra RM UPS, install the power and battery modules after you install the UPS in the rack.



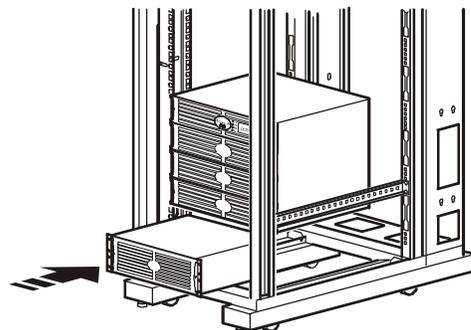
### Install the Step-Down Transformer

The Step-Down Transformer is used with the Symmetra 2–6 kVA or Smart-UPS RT 5000 VA, 7500 VA, and 10000 VA. It can be installed in the same enclosure as your UPS, or in an enclosure with a Rack PDU Extender.



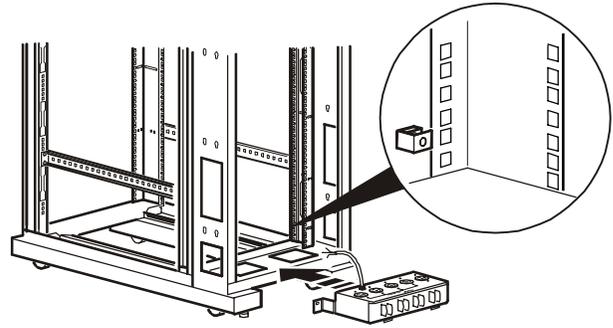
See also

Follow the procedures in the manual included with your Step-Down Transformer.



## Install the Rack PDU Extender

The Rack PDU Extender is used primarily with the Symmetra LX UPS and the NetShelter VX Enclosure. It snaps into the base of the NetShelter VX rear channel, and occupies the bottom 2 U of space behind the rear vertical mounting rails.



# Basic Connection Procedures

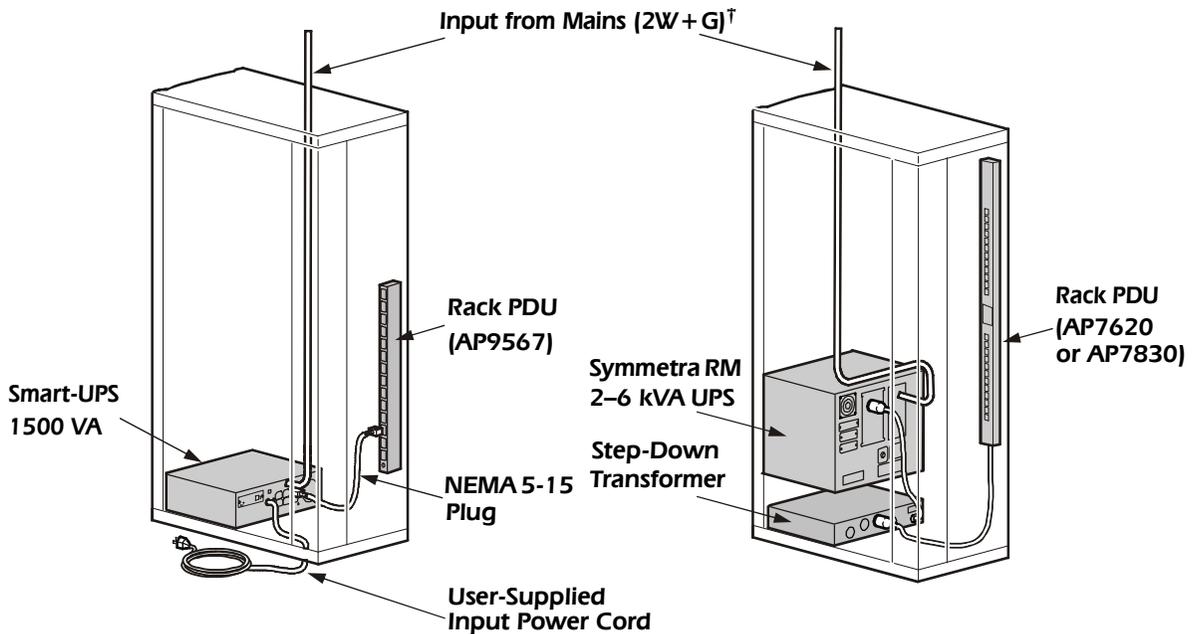
## Overview

The diagrams in this section illustrate typical configurations. Your configuration may vary. If you have questions, consult the user manual of each component, visit the APC Web site ([www.apc.com](http://www.apc.com)), or contact Customer Support at a telephone number on the back cover of this manual. The diagrams are only a guide as to what steps you will need to take.



Warning

**Do not use only these diagrams to connect your equipment. Read and follow the safety and connection instructions in the manual included with your UPS and power distribution equipment.**

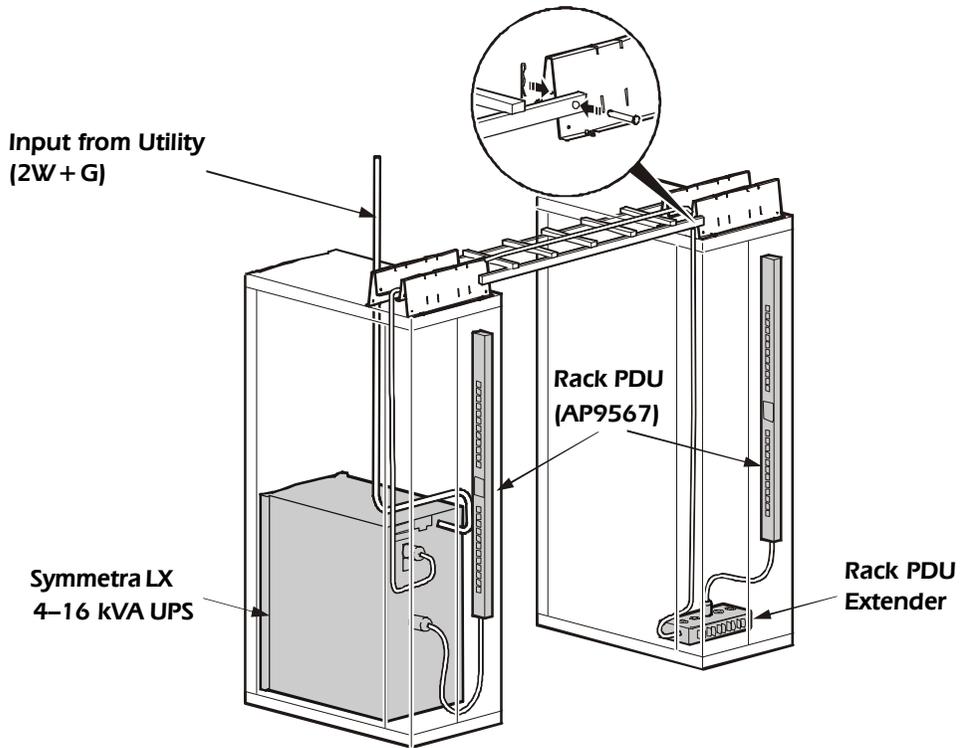


**Smart-UPS**  
1500 VA, 2200 VA, 3000 VA

**Symmetra RM UPS**  
2–6 kVA

**Smart-UPS RT**  
1500 VA, 2400 VA, 5000 VA, 7500 VA,  
10,000 VA

†For Smart-UPS configuration, **Input from Mains** applies to Smart-UPS RT 7500 VA and 10,000 VA only.

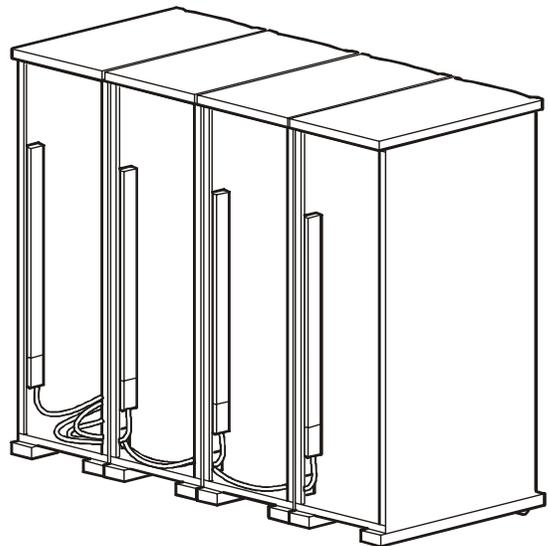


**Symmetra LX UPS**  
4-16 kVA

†The Rack PDU Extender uses a 28-foot (8.5-meter) cord to provide power to a second rack.

### Connect Rack PDUs to the UPS

Route the Rack PDU power cords to the UPS through the bottom of the enclosures, using the holes in the enclosures' vertical posts. Plug each power cord into an outlet on the UPS, Step-Down Transformer, or Rack PDU Extender. The diagram shows vertical Rack PDUs; however, you can use any APC Rack PDUs with plugs that match your UPS, Step-Down Transformer, or Rack PDU Extender outlets. See "Electrical output" on page 5 for information on the outlet type of each UPS.



## Connect UPS Batteries

The Smart-UPS models are shipped with the batteries installed; however, you must make the necessary connections to energize the batteries before the UPS will operate.

Ensure that the battery modules in the Symmetra RM or Symmetra LX UPS are seated properly.



**See also**

See the manual included with your UPS for detailed safety and installation instructions.

## Configure APC management devices

Your InfraStruXure System for computer rooms can be managed through the APC Network Management Card or through the InfraStruXure Manager.

If you have an InfraStruXure Manager as part of your system, connect each Network Management Card to the InfraStruXure Manager hub using CAT5 network cables, and configure the InfraStruXure Manager.



**See also**

See the manual included with your InfraStruXure Manager for quick configuration instructions, and see the on-line help on the InfraStruXure Manager's interface for more information on managing the system.

If you do not have an InfraStruXure Manager as part of your system, configure the network settings of each Network Management Card in your system.



**See also**

See the manual included with your Network Management Card for quick configuration instructions, and see the supporting documentation on the CD for more detailed information.

# Warranty

## InfraStruXure Standard Warranty

APC warrants that all components of the InfraStruXure system will be free from defects in material and workmanship for a period of two years from the date of start-up when start-up has been performed by APC authorized service personnel<sup>†</sup>. If assembly services are included in the original purchase and are also performed by APC authorized service personnel, APC offers an additional year of warranty at no additional charge. In the event that the system fails to meet the foregoing warranty, APC shall repair or replace, at its sole discretion, any such defective parts. Under this warranty, APC will ship all parts to your site at no cost, to be available for you the next business day after APC is notified of this requirement. If you choose to upgrade the system to include a contract for on-site service, APC offers modular service packages to match your needs.

Each point product incorporated into the system has a separate factory warranty that is applied when the product is sold as a standalone unit. When incorporated into an InfraStruXure solution, the product will be covered by the InfraStruXure warranty. In cases where one warranty is more favorable to the customer than the other warranty, the stronger of the two warranties will take precedence.

**APC shall not be liable under this warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's or any third person's misuse of the product, negligence, improper installation or testing, unauthorized attempts to repair or modify the product, or any other cause beyond the range of the product's intended use, or by accident, fire, lightning, or other hazard.**

**There are no additional warranties, express or implied, by operation of law or otherwise, of products sold, serviced or furnished under this agreement or in connection herewith. APC disclaims all implied warranties of merchantability, satisfaction and fitness for a particular purpose. The express warranties of APC will not be enlarged, diminished, or affected by and no obligation or liability will arise from the rendering of technical or other advice or service in connection with the products. The foregoing warranties and remedies are exclusive and in lieu of all other warranties and remedies. The warranties set forth above constitute the sole liability of APC and the purchaser's exclusive remedy for any breach of such warranties. All APC warranties apply only to the purchaser and are not extended to any third parties. In no event shall APC, its officers, directors, affiliates, or employees be liable for any form of indirect, special consequential or punitive damages arising out of the use, service or installation of the products, whether such damages arise in contract or tort, irrespective of fault, negligence or strict liability or whether APC has been advised in advance of the possibility of such damages.**

<sup>†</sup> All warranties are null and void unless installation and start-up are performed by authorized APC Global Services service centers.





## APC Worldwide Customer Support

Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to access documents in the APC Knowledge Base and to submit customer support requests.
  - **www.apc.com** (Corporate Headquarters)  
Connect to localized APC Web sites for specific countries, each of which provides customer support information.
  - **www.apc.com/support/**  
Global support searching APC Knowledge Base and using e-support.
- Contact an APC Customer Support center by telephone or e-mail.
  - Regional centers:

Direct InfraStruXure Customer Support Line	(1)(877)537-0607 (toll free)
APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702000 (Ireland)
Japan	(0) 3 5434-2021
Australia, New Zealand, South Pacific area	(61) (2) 9955 9366 (Australia)

- Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

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