

**NetworkAIR™ RM  
Air Distribution  
Unit**

ACF003

**Installation, Operation,  
and Maintenance**

**APC**<sup>®</sup>  
[www.apc.com](http://www.apc.com)



# Contents

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<b>General Information</b> .....	<b>1</b>
Introduction	1
Features	1
<b>Safety Information</b> .....	<b>2</b>
<b>Before you begin</b> .....	<b>3</b>
Inventory	3
Receiving inspection	3
<b>Overview</b> .....	<b>4</b>
Tools required	4
Overview of the installation procedure	4
Equipment placement	4
<b>Installation</b> .....	<b>5</b>
Installing the guide and rail assemblies	5
Installing the duct assembly	7
Cutting the opening in the raised-floor tile(s) (raised floor applications only)	9
Installing the fan assembly	10
Installing the blanking plate	12
Other openings	12
Connecting to the power supply	13
Replacing the perforated floor tile(s)	13
<b>Operation and Maintenance</b> .....	<b>14</b>
Start-up	14
When to use only one fan	15
Replacing the air filter	15
<b>Warranty and Service</b> .....	<b>16</b>
Limited warranty	16
Warranty limitations	16
Obtaining service	17

**Life-Support Policy . . . . . 18**  
General policy **18**  
Examples of life-support devices **18**

**Specifications . . . . . 19**

# General Information

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## Introduction

The NetworkAIR RM Air Distribution Unit works with an existing precision A/C system to deliver cool air to the equipment contained in a NetShelter enclosure or other 19" EIA-310-D enclosure with an open or removable floor. The Air Distribution Unit, installed at the bottom of the enclosure, pulls supply air directly into the enclosure, thereby preventing the conditioned air from mixing with warm ambient air before it reaches the equipment. The dual fans provide the increased air flow needed to cool densely-packed equipment and improves air delivery in poor static pressure areas, solving many of the heat issues facing today's data centers.

## Features

Features of the RM Air Distribution Unit include:

- Compact size (2 U)
- Dual input connectors for redundant power
- Two fans with independent switches
- Replaceable air filter—30% efficient by ASHRAE standard 52.1-1992.

## Safety Information

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**Disconnect power to the enclosure before installing the Air Distribution Unit. Failure to do so may result in personal injury or damage to equipment.**

**Check to see that a fan guard is securely in place over each of the air inlet openings.**

**Do not apply power to the unit until the installation is complete. The Air Distribution Unit contains moving parts, which are potentially hazardous when operated outside of the enclosure.**

**Keep fingers and clothing away from the fans. When powered on, they have moving parts which can cause personal injury.**

**Do not attempt to move a heavily loaded enclosure by yourself. Doing so introduces risk of injury due to muscle strain or the tipping of the enclosure. Fully loaded enclosures require at least two persons to move safely.**

**Keep the included alcohol swab away from sparks or open flames.**

**Check that the power cord plugs and sockets are in good condition before installation.**

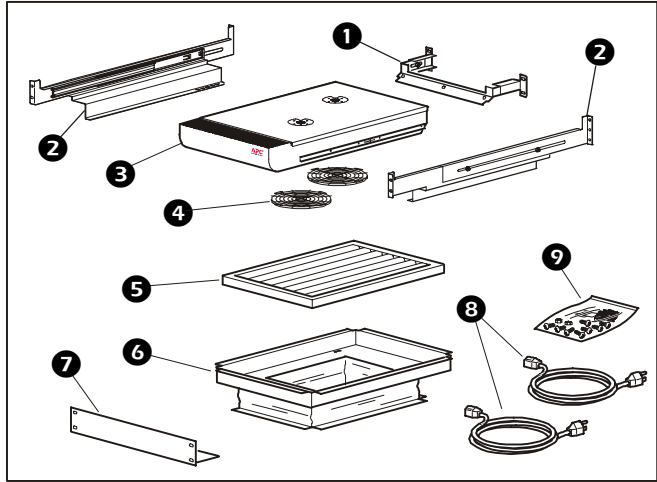
**Connect the Air Distribution Unit to a three-wire, 100 Volt outlet. The outlet must be connected to appropriate branch circuit/mains protection (fuse or circuit breaker). Connection to any other type of outlet may result in a shock hazard.**

**This equipment contains potentially hazardous voltages. Do not attempt to disassemble the unit.**

**Always install and operate the Air Distribution Unit as shown in this manual.**

## Before you begin

### Inventory



Item	Description	Quantity
1	Stop bracket	1
2	Left-and right-side guide and rail assembly	1 each
3	Fan assembly	1
4	Air intake fan guards	2
5	Replaceable air filter (ACF001RF)	1
6	Duct and bellows assembly	1
7	Blanking plate	1
8	Power cords (NEMA 5-15 METI Denan)	2
9	Accessories and fasteners	
	• Caged nut	16
	• Caged nut installation tool	1
	• Screw—M6 × 12 mm Phillips pan-head	16
	• Alcohol wipes	3
	• Plastic washers	16

### Receiving inspection

Inspect the package and contents for shipping damage, and make sure that all parts were sent. Report any damage immediately to the shipping agent, and report missing contents, damage, or other problems immediately to APC or your APC reseller.

# Overview

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## Tools required

You will need the following to install the Air Distribution Unit:

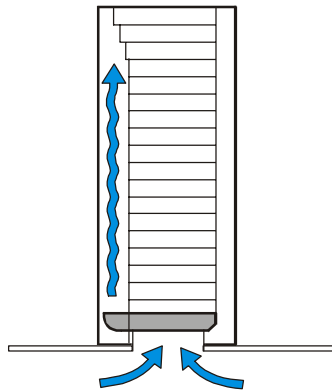
- Pencil
- Saw or other tool for cutting a hole in the raised floor tile(s) (raised floor application only)
- Caged nut tool (provided)
- 7-mm wrench or nut driver
- Phillips screwdriver

## Overview of the installation procedure

The Air Distribution Unit can be installed in both raised-floor and non-raised-floor applications. The unit is installed in the bottom 2U of the NetShelter enclosure or other 19" EIA 310-D enclosure with an open or removable floor. The raised floor application will require an opening in the raised floor, directly under the enclosure. With the enclosure in place, install several parts of the Air Distribution Unit so that you can mark the location and size for this opening. Then move the enclosure and remove the floor tile(s) to cut the opening. After reinstalling the tiles and the enclosure, complete the installation. See the following paragraphs in this section for the installation procedure.

## Equipment placement

To avoid interference with air flow, use the uppermost part of the enclosure for any equipment that extends forward over the air outlet of the Air Distribution Unit.





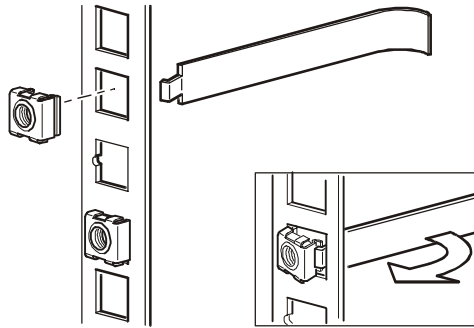
# Installation

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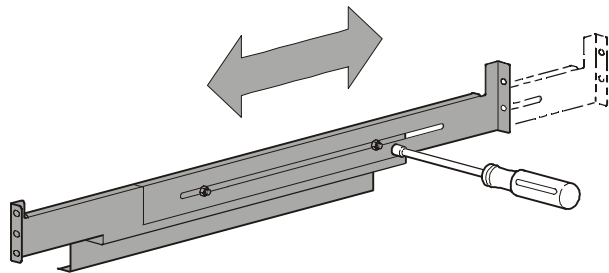
## Installing the guide and rail assemblies

To install the guide and rail assemblies:

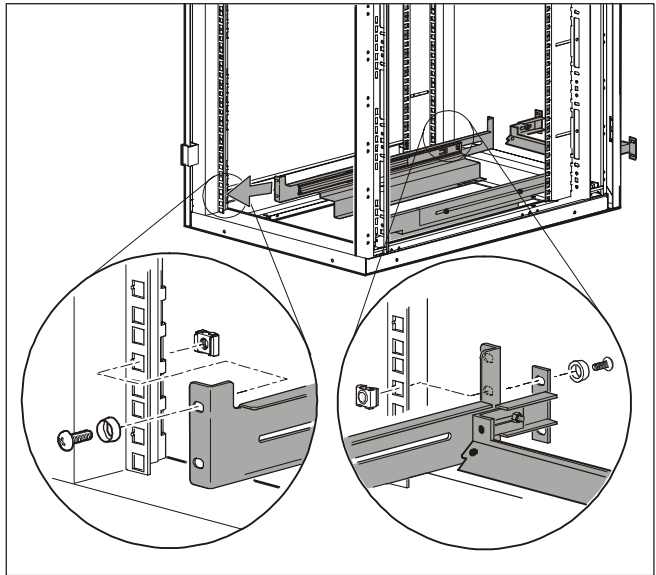
1. Remove the bottom panel of the enclosure.
2. Locate the position for the guide and rail assembly on each of the four vertical mounting rails of the enclosure, at the second U from the bottom. (To identify a U on a mounting rail, see the documentation provided with your enclosure.)
3. Using the caged nut tool (provided), install the caged nuts in the corresponding mounting holes on the interior of each vertical rail.



4. If necessary, adjust the length of the guide and rail assemblies to fit the depth of your enclosure by loosening the 7-mm nuts on the outside of each rail.



5. From the front of the enclosure, attach the front guide and rail flanges to the outside of the vertical rails using four, M 6 × 12 mm, Phillips pan-head screws and four plastic washers. Push and hold each bracket firmly toward the outside of the enclosure when tightening screws.
6. At the rear of the enclosure, attach the rear guide and rail flanges to the outside of the vertical rails using two, M 6 × 12 mm, Phillips pan head screws and two, plastic washers in the top hole of each guide and rail assembly. Push and hold each bracket firmly toward the outside of the enclosure when tightening screws.
7. Mount the stop bracket over the guide and rail assemblies and install four, M 6 × 12 mm Phillips pan-head screws and four plastic washers into the two lower holes of each guide and rail.

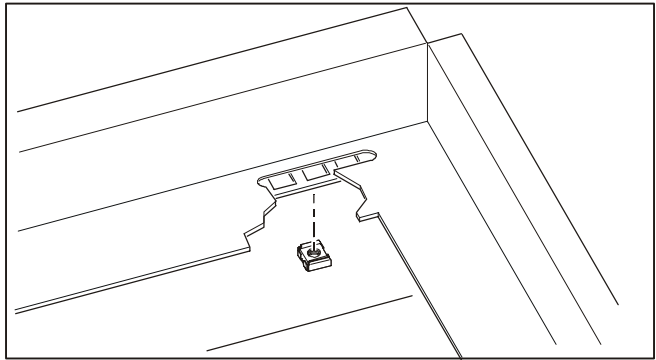


8. After the rails are in position retighten any nuts loosened in step 4.

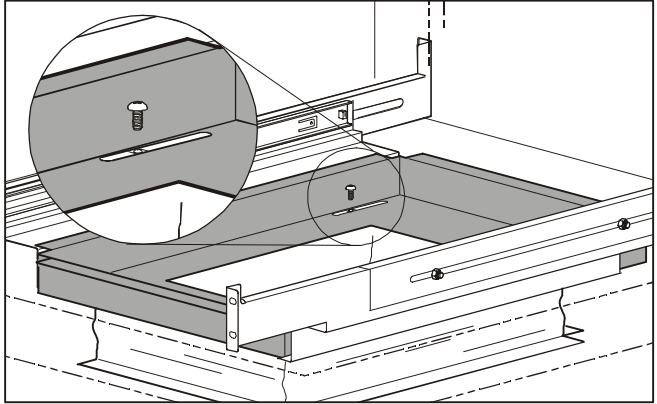
**Installing the  
duct assembly****Note**

For non-raised floor applications you must remove the bellows for proper operation. Pull apart the hook-and-loop tape holding the bellow to the duct.

1. With the slotted holes positioned to the rear of the enclosure, place the duct and bellows assembly onto the guide and rail assemblies. Slide the assembly forward as far as it will go.
2. Locate the holes in the bottom of each rail flange that align with the center of the duct and bellows assembly slots. Using the caged nut tool, install a caged nut in each of these holes.



3. Fasten the duct and bellow assembly to the rail assemblies using two, M6 ×12mm, Phillips pan-head screws and the caged nuts installed in last step.

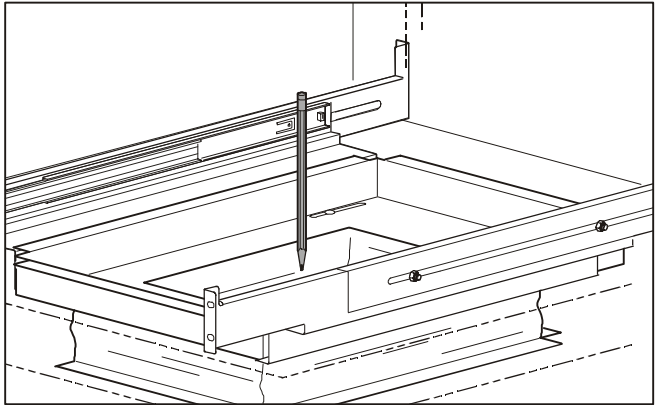


**Note**

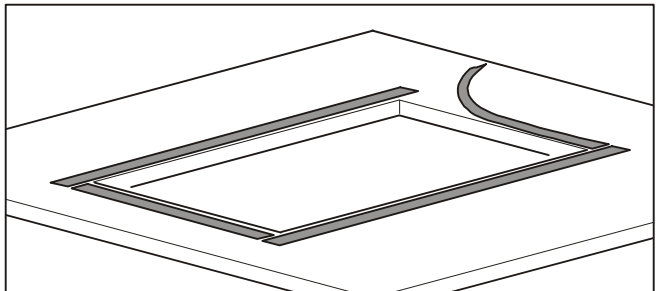
For non-raised-floor applications proceed to “Installing the fan assembly” on page 10.

**Cutting the opening in the raised-floor tile(s) (raised floor applications only)**

1. Using the inside edge of the duct opening as a template, mark the location for the opening to be created in the raised floor tile.

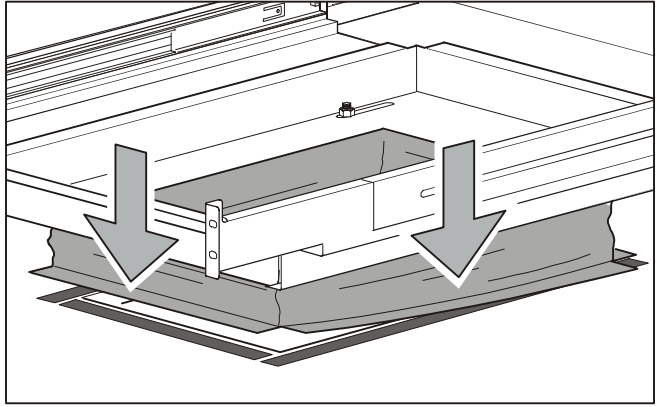


2. Move the enclosure to provide access to the floor tile(s) for cutting.
3. Remove the floor tile(s) and cut an opening in the tile(s) at the location marked. Use tools that will provide a clean, accurate cut.
4. Using the supplied alcohol swab, clean the edges of the opening in the floor tile.
5. Remove the hook halves of the hook-and-loop tape from the bottom lip of the fabric portion of the duct. Remove the protective plastic covering the adhesive. Place the tape along the perimeter of the opening, adhesive-side down.



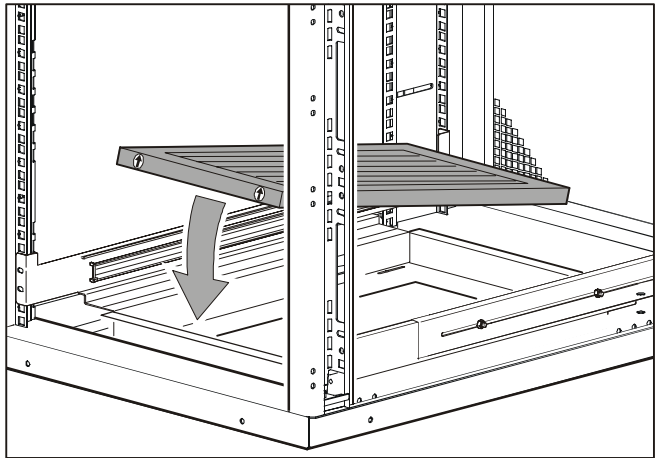
6. Reinstall the floor tile in its original position.

7. Move the enclosure to its original position and stabilize.
8. Attach the bellows to the floor using the hook-and-loop tape.

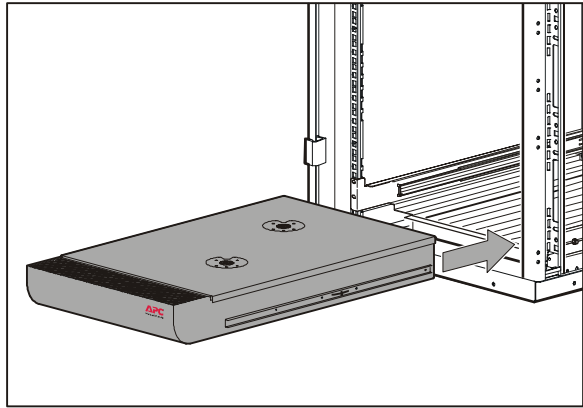


**Installing the fan assembly**

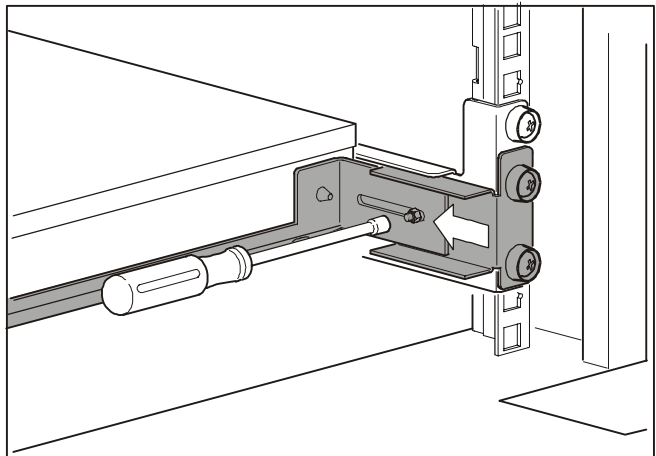
1. Place the filter in the filter housing of the duct. Place the filter so that the arrow on the filter points upward to match the intended air flow of the air distribution unit.



2. With the front of the fan assembly facing the front of the enclosure, insert the rails on the sides of the fan assembly into the guides on the guide and rail assemblies.
3. Slide the fan assembly toward the rear of the enclosure until the rails lock in place.
4. Tighten all the screws holding the guide and rail assemblies to the vertical rails.



5. Close the front door of the enclosure and, from the rear, push the fan assembly fully forward until it touches the front door of the enclosure.
6. Using a 7-mm wrench or nut driver, adjust the stop bracket to prevent the fan assembly from sliding back towards the rear of the enclosure.



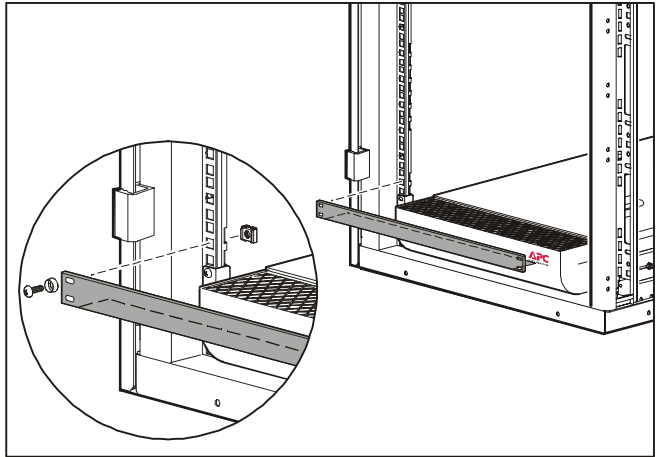
## Installing the blanking plate



### Note

If the 3 U position immediately above the Air Distribution Unit is open, you must cover it with the blanking plate provided for proper operation and maximum cooling.

1. Using the caged nut tool, install the caged nuts in the corresponding mounting holes on the inside of each vertical rail.
2. Attach the blanking plate, with the flange located at the bottom, using the four, M6 × 12 mm, Phillips pan-head screws and four, plastic washers.



## Other openings

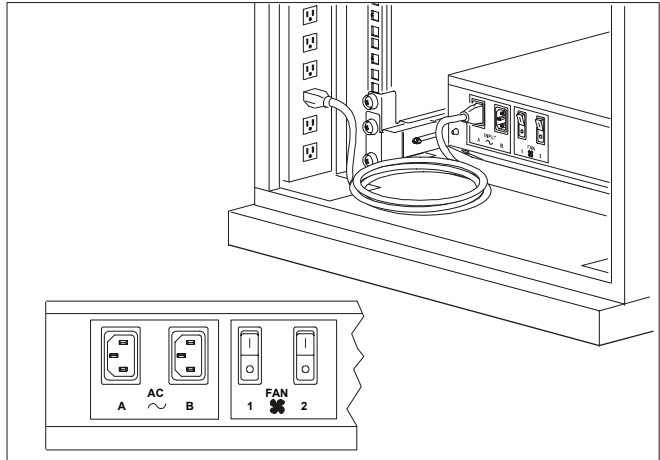
For proper operation and maximum cooling, all other openings in the enclosure should be covered using standard blanking plates—(not provided).



### Connecting to the power supply

To supply power to the Air Distribution Unit:

1. Using one of the supplied power cords, connect the female end to one of the input sockets on the rear of the unit. Plug the male end into a UPS or other socket that provides protected power.



2. To provide redundant power to the unit, use the remaining socket to connect to a second source of protected power.
3. Cords may be bundled and tie-wrapped to provide clearance for other components.

### Replacing the perforated floor tile(s)

The perforated floor tile(s) in front of the enclosure containing the Air Distribution Unit can be replaced with solid floor tiles under these conditions:

- If other equipment in the vicinity is not dependant on the airflow.
- If under-floor pressure is a concern.

Replacing the perforated floor tile(s) can increase air flow in other areas of the data center.

# Operation and Maintenance

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## Start-up

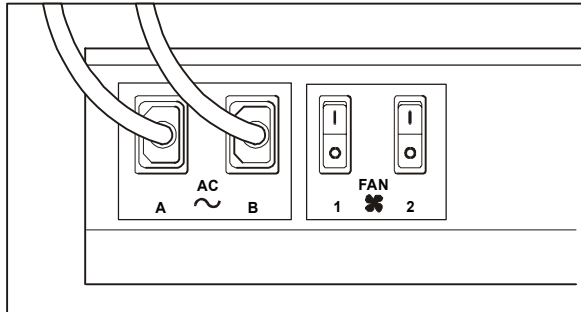


**Before applying power to the Air Distribution Unit, remove any debris that may be located in or near the fan rotors. Failure to remove debris can result in damage to equipment or cause bodily harm.**

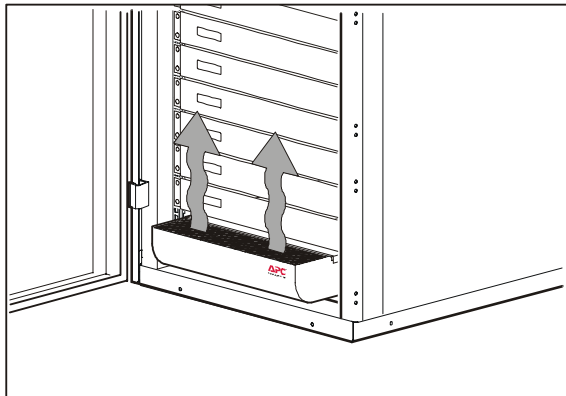
**Do not apply power to the unit with the air intake fan guards removed.**

Check operation of the unit:

1. Apply power to Fan 1 by pressing the corresponding switch on the rear of the unit.



2. Air should be flowing out of the Air Distribution Unit.
3. Turn off the Fan 1 and repeat for Fan 2.



**When to use only one fan**

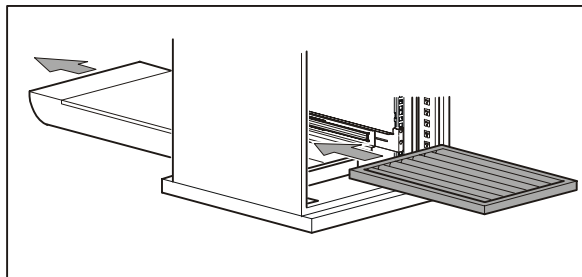
Depending on your enclosure's height and the heat output of installed equipment, you may choose to operate only one fan, thus reducing energy consumption. Smaller enclosures often require only one operating fan.

You may also choose to operate both fans during normal operation, and turn off one fan in the event of a loss of utility power. This will conserve run-time on the battery of the UPS.

**Replacing the air filter**

Replace your air filter whenever other system air filters are scheduled to be replaced or at a minimum once a year.

1. Turn off both fans on the fan assembly, and wait for the fans to stop.
2. Unplug the power cord(s) from back of Air Distribution Unit.
3. Open the front door of the enclosure and slide the fan assembly forward as far as it will go.



4. From the rear of the enclosure, remove the old filter and replace with new filter (3-pack—ACF001RF).



**Note**

In some situations the air filter will need to be accessed from the front of the enclosure because of interfering wires and cables. To access the filter from the front, slide out and remove the fan assembly.

## Warranty and Service

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### Limited warranty

APC warrants the Air Distribution Unit 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. 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.

### Warranty limitations

**Except as provided herein, APC makes no warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.** Some jurisdictions 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. This warranty gives you specific legal rights and you may also have other rights, which vary according to jurisdiction.

**Obtaining  
service**

To obtain support for problems with your Air Distribution Unit:

1. Note the serial number and date of purchase. This can be found on the back of the Fan Assembly.
2. Contact Customer Support at a phone number on the back cover of this document. A technician will try to help you solve the problem by phone.
3. If you must return the product, the technician will give you a return material authorization (RMA) number. If the warranty expired, you will be charged for repair or replacement.
4. Pack the unit carefully. The warranty does not cover damage sustained in transit. Enclose a letter with your name, address, RMA number and daytime phone number; a copy of the sales receipt; and a check as payment, if applicable.
5. Mark the RMA number clearly on the outside of the shipping carton.
6. Ship by insured, prepaid carrier to the address provided by the Customer Support technician.

## Life-Support Policy

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### General policy

American Power Conversion (APC) does not recommend the use of any of its products in the following situations:

- In life-support applications where failure or malfunction of the APC product can be reasonably expected to cause failure of the life-support device or to affect significantly its safety or effectiveness.
- In direct patient care.

APC will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to APC that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) the liability of American Power Conversion is adequately protected under the circumstances.

### Examples of life-support devices

The term *life-support device* includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), autotransfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults and infants), anesthesia ventilators, infusion pumps, and any other devices designated as “critical” by the U.S. FDA.

Hospital-grade wiring devices and leakage current protection may be ordered as options on many APC UPS systems. APC does not claim that units with this modifications are certified or listed as hospital-grade by APC or any other organization. Therefore these units do not meet the requirements for use in direct patient care.

# Specifications

<b>Item</b>	<b>Model</b>
	<b>ACF003</b>

## Electrical

Power source	100V; 60Hz
Rated current (both fans)	2.5 A

## Physical

Physical dimensions (h × w × d)	3.5 × 16.6 × 29 in (89 × 421 × 737mm)
Net weight (unit only)	41 lbs (19kg)
Shipping weight	59 lb (27kg)

<b>Airflow</b>		Raised floor	Non-raised floor
Without filter and finger guards installed	50 Hz	* 966 m <sup>3</sup> /h	* 754 m <sup>3</sup> /h
	60 Hz	* 1021 m <sup>3</sup> /h	* 817 m <sup>3</sup> /h
With filter and finger guards installed	50 Hz	* 773 m <sup>3</sup> /h	* 595 m <sup>3</sup> /h
	60 Hz	* 805 m <sup>3</sup> /h	* 629 m <sup>3</sup> /h

## Sound level

Both fans running	73 dB @ 1m
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\* When installed over standard raised floor @ 16.9 mbar.







## 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 find answers to frequently asked questions (FAQs), to access documents in the APC Knowledge Base, and to submit customer support requests.
  - [www.apc.com](http://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/](http://www.apc.com/support/)  
Global support with FAQs, knowledge base, and e-support.
- Contact an APC Customer Support center by telephone or e-mail.
  - Regional centers:

APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702020 (Ireland)
Japan	(03)5434-2021 Guidance 3

- Local, country-specific centers: go to [www.apc.com/support/contact](http://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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