

**ESSEX** BY MIDDLE ATLANTIC

# RCS SERIES

**Residential Configured Rack**



APPLICATION GUIDE

what **great systems** are built on.™



# GETTING TO KNOW YOUR RCS SERIES

ALL RCS SERIES RACKS ARE PRE-CONFIGURED WITH



Glass Front Door



Rear Access Panel



Removable Locking Side Panels



Active Cooling



Locking Casters & Leveling Feet

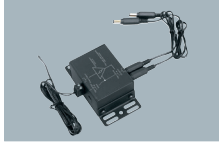


	RCS-4224	RCS-3524	RCS-2724	RCS-1824
Rack Weight Rating	1,200 lbs.	1,000 lbs.	750 lbs.	500 lbs.
Shelves*	(5) 2 space, 16" deep (50 lbs.) (2) 2 space, 18" deep (50 lbs.) (2) 3 space, 20" deep (100 lbs.)	(5) 2 space, 16" deep (50 lbs.) (2) 2 space, 18" deep (50 lbs.) (2) 3 space, 20" deep (100 lbs.)	(4) 2 space, 16" deep (50 lbs.) (1) 2 space, 18" deep (50 lbs.)	(3) 2 space, 16" deep (50 lbs.)
1 Space Blank Panels*	9	7	5	3
Overall Dimensions	24"D 23-5/8"W 80-5/8"H	24"D 23-5/8"W 68-3/8"H	24"D 23-5/8"W 54-3/8"H	24"D 23-5/8"W 38-5/8"H

\*Shelves and panels are pre-installed

# GETTING TO KNOW YOUR RCS SERIES

## COMPATIBLE ACCESSORIES



Proportional Speed Thermostatic Control (FC-DC)



Vertical Accessory Bracket (ESX-ACC-BKT)

PART #	VERTICAL POWER (requires ESX-ACC-BKT)
RCS-1824	PWR-8-V, PWR-16-V
RCS-2724	PWR-8-V, PWR-16-V
RCS-3524	PWR-8-V, PWR-16-V, PWR-24-V
RCS-4224	PWR-8-V, PWR-16-V, PWR-24-V



Rackmount Power Distribution



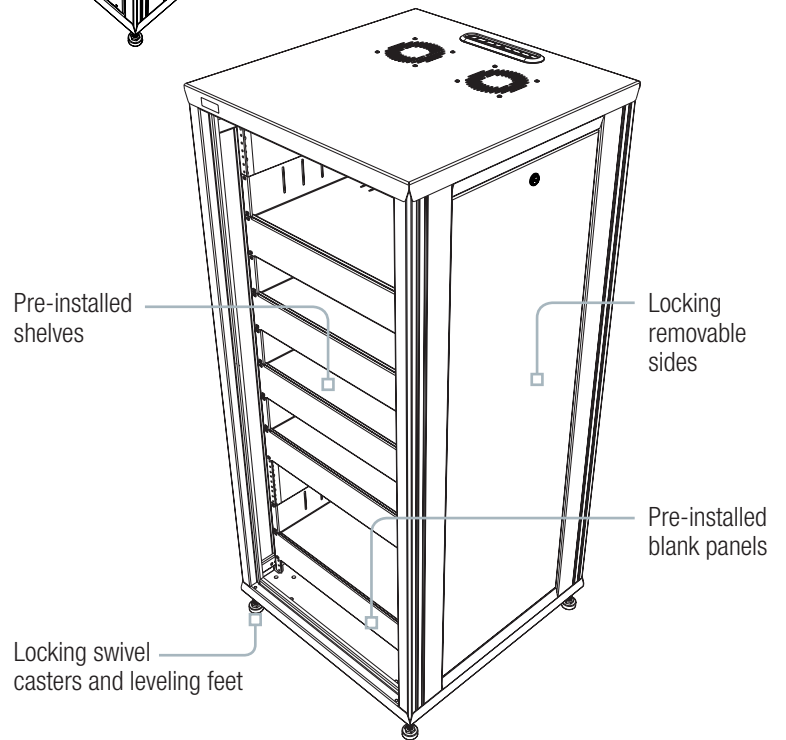
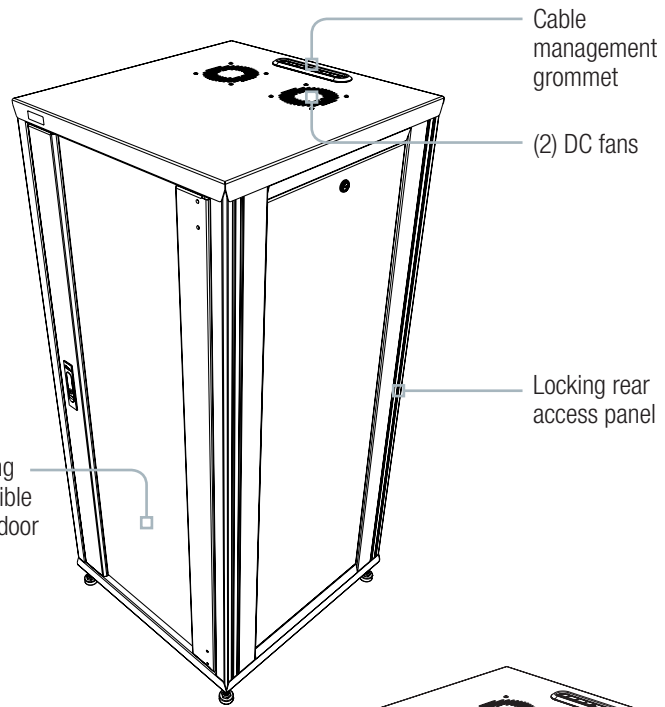
Rackmount Storage



RSH Rackshelves



Cable Management



# RACK SYSTEMS: OVERVIEW



The RACK is the foundation of an integrated rack system.

## OVERVIEW

Professionals use rack systems because they provide a range of benefits for both the installer and for the installed equipment system owner and users, including:

### 1. Equipment Protection

Racks not only physically support and protect electronic gear, they also play an important role in power distribution and thermal and cable management. These last two topics are of critical importance because they can directly impact system reliability and life. A well-designed rack system provides the ideal environment to maximize equipment performance.

### 2. Easier Maintenance and Upgrades

Rack systems can provide for rear access to equipment and connections when service is required. And, racks make equipment changes and additions easy too. Deciding to use a rack system at the start of the project is the best time to make these activities easy later on.

### 3. Professional Appearance and Functionality

A rack installation, done properly, is a display of professionalism. It has a clean, functional style that can fit in many environments, in the open or hidden. And there are many rack accessories that can further enhance the function and convenience of the installation, such as CD and DVD storage shelves, drawers, and even docks for portable music players. We can help you plan and deliver excellent installations. This guide includes information about the “four essentials” of an integrated rack system for your convenience:

- Racks, the backbone of any integrated system
- Power Distribution
- Cooling, or Thermal Management
- Cable Management

We hope you find this information useful. To learn more about racks and rack systems, please visit our website or give us a call.



## BASIC RACK STANDARDS

- The Electronic Industries Alliance (EIA) developed a standard sizing system for racks so that AV equipment from any maker will fit properly in the rack.
- You will frequently hear the term “rackspace”, or sometimes “rack units” or “RU”. This is the standard unit for the height of equipment and rack capacity. Each rackspace equals a height of 1.75”. (So, for example, a “four rackspace” component will be 7” tall.)
- Racks for AV applications come with threaded rackrail. This is where the rackmount equipment is actually fastened to the rack with screws. Standard US rack screws use 10-32 threads, so nearly all of your work will use this size. Some data center racks use larger sizes, and some foreign-made racks use metric screws. If the screws don’t seem to fit properly, stop to make sure you have the correct size.
- Standard AV equipment and racks are 19” wide; this is the size you will see most often. Some special applications in data cabling use wider racks.

Note: The RCS Series racks, and most of Middle Atlantic’s racks and enclosures, include rackrail that is bracketed and numbered to show rackspaces as shown in the picture. This makes it easier to align and install equipment into the rack.

# PLANNING THE INSTALLATION



FIGURE A

## INSTALLATION

- If you haven't done so already, make sure you select a rack of sufficient size to hold the desired equipment. If you can, plan for some extra space for later expansion. Choose a rack that is deep enough not only for your deepest equipment, but for the necessary connections to the back of that equipment.
- Place equipment that would be frequently accessed, such as DVD, CD players, at the best height for viewing and or ergonomics. (See **FIGURE A** for an example). This RCS Series rack system has shelves pre-installed at the factory at commonly-used positions, but you can move them to suit your needs.
- As a rule of thumb, 2/3 of the total weight of equipment should be loaded in the bottom 1/3 of the rack. This would include equipment such as amplifiers and heavy receivers. Following this formula helps to avoid tipping hazards – especially important for racks that are equipped with casters for moving. Always move a loaded rack with great caution and plenty of help.
- Once in place, leveling feet can be extended for additional stability.

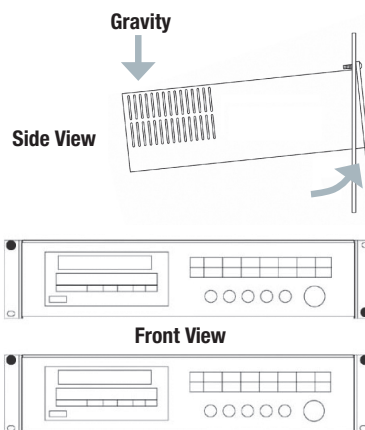
**1** Cable/Satellite Receiver    **2** DVD/CD/Storage    **3** Receiver/Amplifier

## LOADING EQUIPMENT

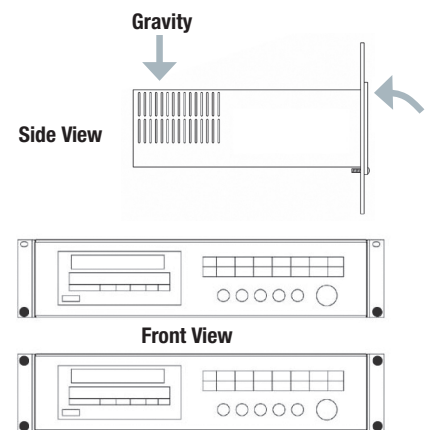
### Helpful tips of the trade:

- Start at the bottom of the rack and work your way up to the top when loading equipment. This method helps keep the rack stable, helps make sure you are starting at a rack space (1.75" increments), and helps support each new piece as it is added to the rack and fastened in.
- **The Cantilever Effect**  
When rackmounting equipment, it is very important that you do not put unwanted flex or twisting on the component. This could cause harm to circuit boards and/or connection that are attached to the chassis of the equipment.

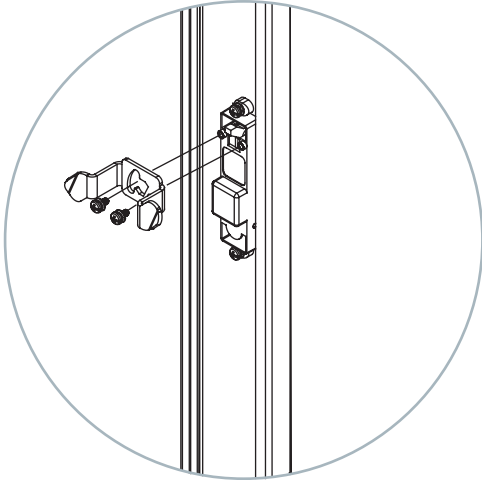
**Wrong Way**  
(do not use top rack screws alone)



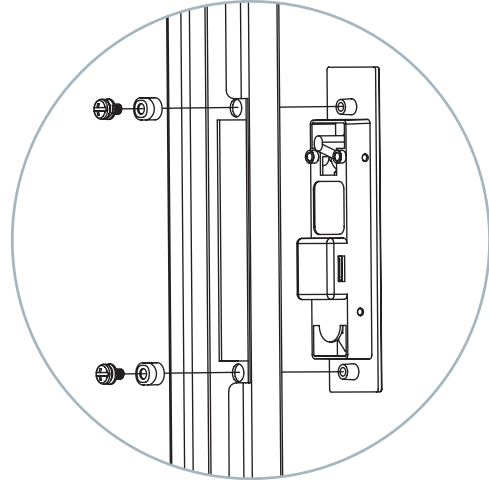
**Correct Way**  
(install bottom rack screws first)



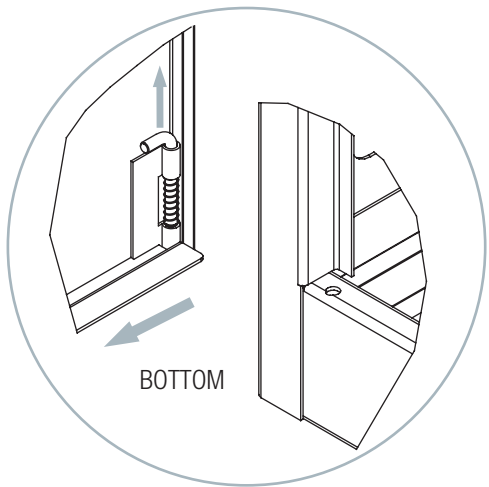
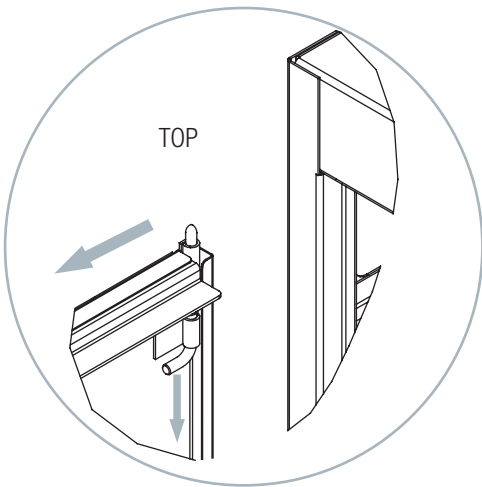
# FRONT DOOR REVERSAL



1. Remove the two screws and cam.



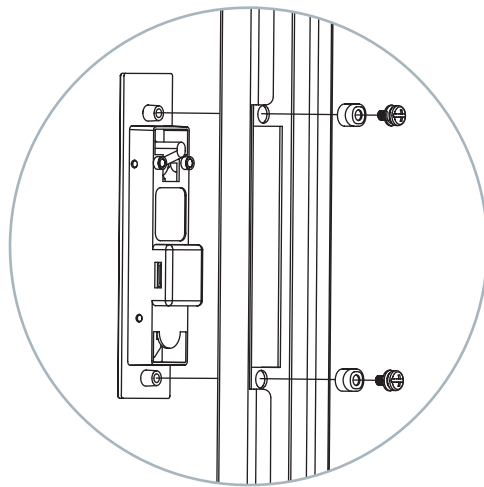
2. Remove the two screws and handle.



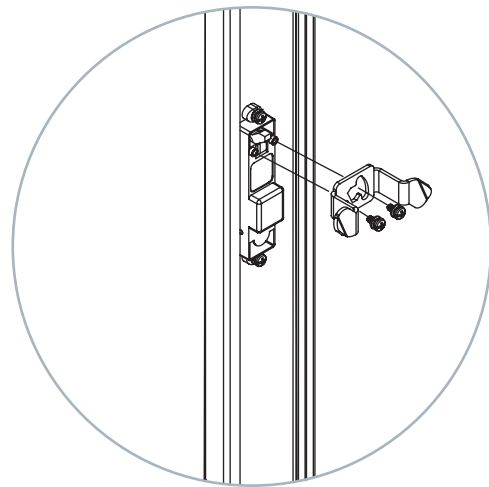
3. Remove the door by pulling on the top spring loaded hinge pin – supporting the door with your other hand. The door should then lift out; if it doesn't, pull up on the lower hinge pin to release.

# FRONT DOOR REVERSAL

- 4.** Rotate the door 180°. Reinstall the door. Set the lower hinge pin first  
then pull the upper hinge pin and align with upper hinge pin hole.



- 5.** Reinstall the handle using the two screws.



- 6.** Reinstall the cam.

# CABLE MANAGEMENT



FIGURE A

One of the key advantages of using an equipment rack system is that the rack provides a protective structure that can support good cable management. Please note that good cable management practices can avoid a number of possible problems, including electromagnetic noise interference, equipment damage, and even shortened system life. Done well, you can deliver a professional appearance and make troubleshooting and future upgrades easier too.

## Cable Routing

Plan your cable routing. When power or speaker cables run too close to signal cables, it is possible that you might hear some buzzing from your system. To prevent these noise problems, avoid running signal cables parallel to power cables within 2" of each other. While not a necessity, many professionals make it a habit of running power cables on one side of a rack, and signal cables on another. Or you can avoid interference by using industry-leading SignalSAFE® power cords - see pg. 10 for more information.

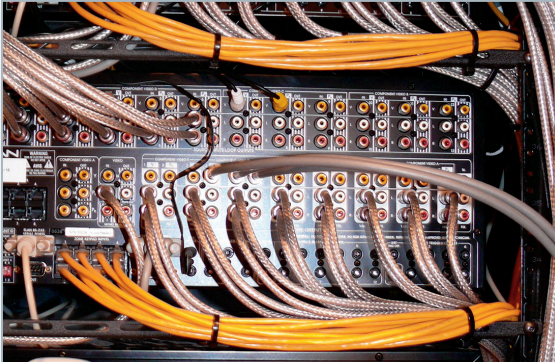
Here's an example of what a completed RCS Series installation might look like. (See **FIGURE A**) Note that power cables are dressed to one side, signal cables to the other. Note how the cables are secured to the convenient cable management points. And, note how the connections are made with gentle bends and secured to prevent stress on the connection points.

1. **Maintain adequate bend radius** along the entire length of the cables. Sharp bends cause stress points in cables, and can decrease their performance. A rule of thumb is to keep the bend radius at least 4 times the diameter of the cable, and the larger (more gentle bend) the better. Check every place where the cable changes direction for best results.
2. **Don't leave cables under tension.** Route cables gently and avoid pulling too hard on them. Once in place, check them for tension so that it doesn't end up pulling on a connector or causing a sharp bend. In general, the rule of thumb is to never exceed a pull force of 25 lbs., but specific information is available from cable manufacturers.
3. **Ensure that you have no strain** at the termination or connector of the equipment. Most equipment today has the connector attached to a circuit board that is mounted inside the chassis of the unit. If there is too much force on the termination, it can crack the circuit board and cause severe internal damage to the equipment.
4. **Label cables** for quick identification. This makes troubleshooting easier now, and makes maintenance, changes and upgrades easier later.

# HOT TIP



# CABLE MANAGEMENT



## Cable Management

Here are some example installations of larger systems. Note the gentle bends to maintain the maximum bend radius and prevent strain on the equipment connections.

Also note the use of cable management tie points to provide support to the cables as they approach the connections.

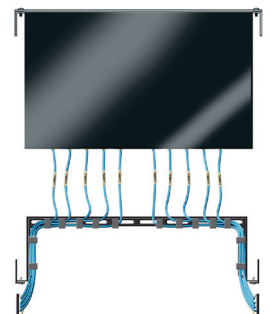


1. Some cables used in AV systems are fairly robust. Power cords, for example, can usually be tightly clamped without damaging them. Digital signal cables, including fiber connections and digital connections (such as “network cables”), can be much more sensitive. These cables are designed with important small internal air spaces – pinching them tightly will decrease their performance and might damage them permanently.
2. In the pictures above, you can see that plastic “wire ties” were used to secure the cables. You can use wire ties, particularly for power cables and analog signal wires, but be careful not to tighten them more than necessary to hold the cables in place.
3. An alternative method that is becoming very popular is to use flat “hook and loop” (Velcro®-style) wire ties that not only treat the cables gently (spreading the force out over a larger area) but they can also be repeatedly opened and resecured during installation or later changes and are required for CAT5E/6 cable. Middle Atlantic recommends these fasteners; note that the rack was designed with many possible tie points for this purpose.

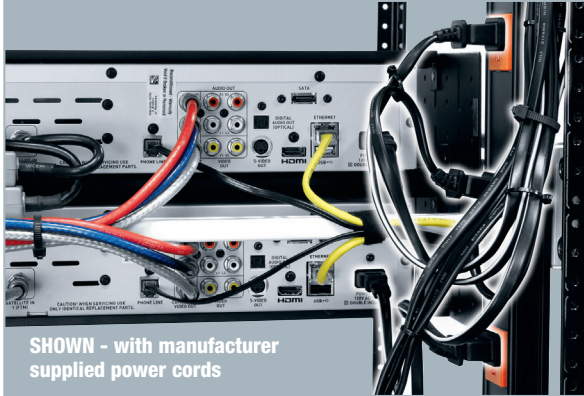
## HOT TIP

**Offset lacer bars are used to provide support closer to the equipment connection points. Tying the cables to the lacer bar prevents strain on the connections while still leaving room for labels if desired.**

**Commonly used bars are available with offsets up to 10”.**



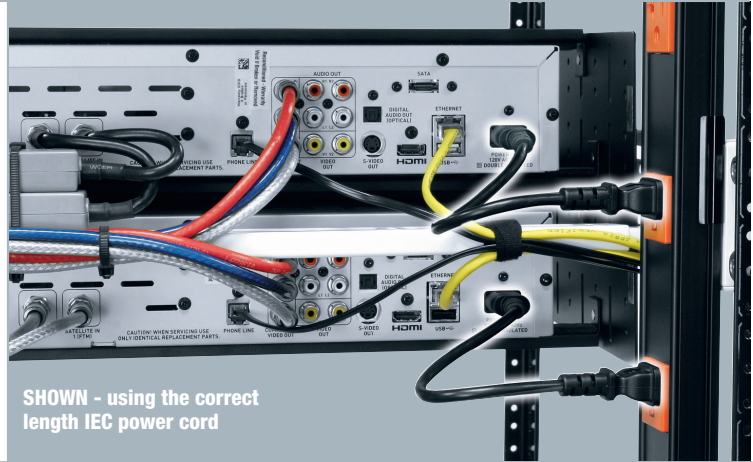
# IEC CORDS



## IEC CORDS

AV equipment is often supplied with a long power cord – 5' to 8' is common. In a rackmount installation, these long cords should not be needed to reach the power distribution. If the power cord is “hard wired”, then you may not have any choice but to bundle the excess cord into a “dog bone” and secure it to the shelf or rack side. Besides being unsightly, these excess lengths are also sources of electromagnetic interference, and they can interfere with cooling airflow that is needed to prevent overheating.

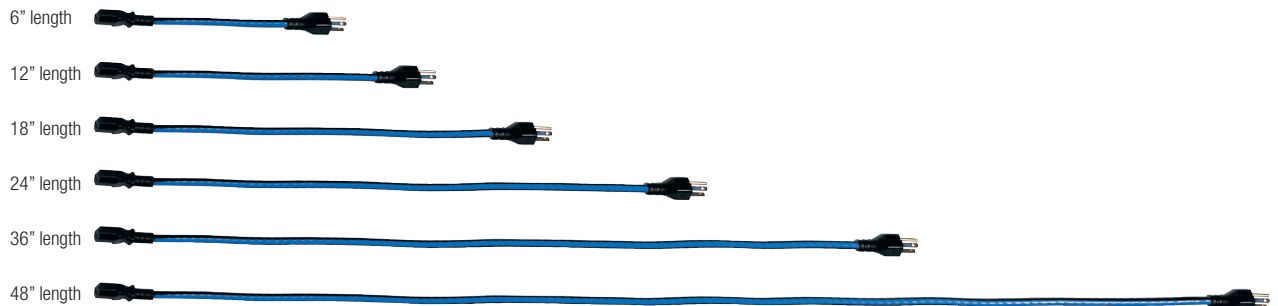
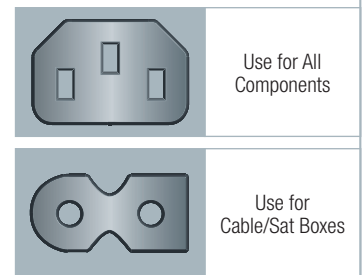
If the manufacturer has provided an “IEC Connection” instead, then you have another option. The IEC connection lets you disconnect the power cord from the AV component, and so it lets the manufacturer provide a range of different plug types for international power needs. The advantage for you is that you can replace the long cord with a short one that can reach the power distribution in the rack but avoids the excess.



IEC Power Cords are available from Middle Atlantic in a range of lengths from 6” to 48”

## SIGNAL INTEGRITY WITH A TWIST

As an added benefit at no extra charge, Middle Atlantic Products has implemented SignalSAFE® technology in all the IEC power cord models. SignalSAFE cords use tightly twisted power conductors to greatly reduce the possibility of electromagnetic interference. Because of this, you get all the benefits of removing the excess length of power cord mentioned above, including improved air flow and reduced electromagnetic interference and, you can also put power and signal cables closer together without the risk of induced noise – much closer than when using standard AC cable in many cases within 1/2” instead of the normal 2” rule of thumb).



# THERMAL MANAGEMENT



## HELPFUL TIPS OF THE TRADE

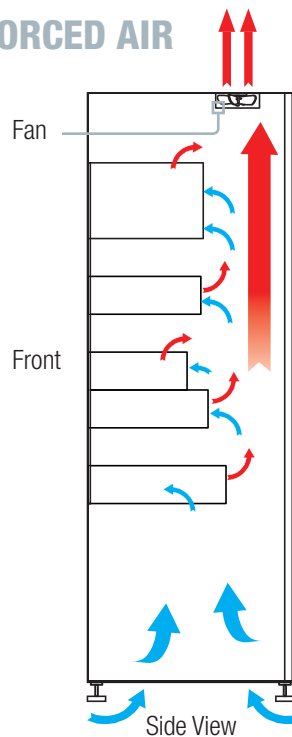
- Maintaining proper equipment temperature is critical.
- 85°F maximum operating temperature inside rack is optimum.
- Proper thermal management is about removing heat and not about adding cool air. Most studies have shown that for every 10°F rise over 85°F, digital equipment life is reduced by approximately 40%!

The RCS Series provides effective active cooling with the pre-installed 4" fans. If the rack will be located in an enclosed area, such as a closet, make sure that area is ventilated.

Passive thermal management is the most reliable and energy efficient way to cool equipment. However, active cooling may be needed for installations with hot-running equipment.

**Proper thermal management example showing CLS-COOLx providing ventilation for equipment closet.**

## PROPER FORCED AIR



# HOT TIP

To ensure a reliable installation, always provide adequate ventilation to the cabinet or closet where the rack is located.

### Resources

Additional resources are available; see [www.middleatlantic.com](http://www.middleatlantic.com) for white papers, and other online tools.

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