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## Rack Cooling 101

Since this month's Coolest Install features a Cool Components Cool Rack, it is only appropriate to address some of the best practices when designing a thermal solution for a rack. There are a few basic types of rack installs and each one requires a different approach to cooling. In this article, we will look at the most common type of install - a simple, open rack.

In an open rack the primary consideration is spot cooling the individual heat generating components such as amplifiers and receivers. The Cool Components Cool Racks (available in 19RU and 40RU versions), have integrated cooling and are a great starting point. The Cool Racks ship with two 50mm 4-fan kits to install in the sides of the top or bottom pans of the rack or in the side panels of the 40RU. Optional 50mm and 92mm fan kits are available to complete the rack. The Cool Components 1RU and 2RU Universal Coolers (CP-UC and CP-UC-2) are great options to spot cool individual rack mountable components. The Cool Components 2-Fan and 4-Fan Rack Side Coolers (RK-SC-2FN and RK-SC-4FN) can be mounted to the side rails and provide extra cooling for side-vented components without consuming precious rack spaces. The entire line of Component Cooling Units (2-Fan, 4-Fan, 4-Fan with Cover, Fully Loaded and 9-Fan) can be placed under or above a component for extreme cooling. For components that are not rack mountable, consider using a Cool Components Cool Shelf (available in 2RU and 3RU) with integrated cooling to keep a hot component sufficiently cool.

The next consideration is venting the enclosure, closet or equipment room where the rack is located. The construction of the home, location of the rack and ambient temperature of the enclosure, closet or room will dictate the proper venting solution. The rack install featured in this month's Coolest Install did not require any additional venting. The space under the stairs where the rack and equipment is installed was already well ventilated due to proper planning by the builder and integrator. Unfortunately, that is not normally the case. If the rack, such as a swivel or pull-out rack is installed in a cabinet or enclosure, a Cool Components HiFlo Basic (VS-HFB) will typically suffice. Simply install the unit in the upper portion of the enclosure to exhaust the heat. A passive vent, such as a toe kick grill (GR-215), may be required to maximize airflow. For small to medium-sized closets and equipment rooms, the Cool Components HiFlo Vent System (VS-HFS) can be installed in the upper portion of a side or rear wall to exhaust the heated air into an adjoining room, closet or hallway. Typically, the space under the door will provide sufficient passive intake to allow for proper airflow. In larger areas, or where it is not possible to vent through a wall, the Ceiling Vent System (VS-CVS) or Inline Duct Fan (VS-IDF) can be used to vent up through the ceiling. Utilizing 4" flexible duct, both products can be connected to the home's HVAC return system or exhausted to another location within the home.

Obviously, as a custom installer, each situation will present different challenges. By following these basic guidelines (and combining them with some common sense), you should be able to devise a practical and effective thermal management solution for your open rack installs. And remember, your team at Cool Components Inc. is available to help you design a viable thermal management solution for your projects.