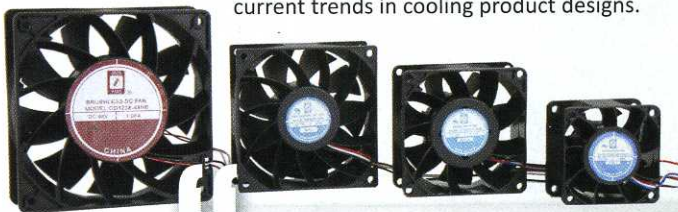


# INNOVATIVE DESIGNS MAKE COOLING FAN CHOICES EASIER

In many cases, thermal management selection is not a top priority in a new product design. But thanks to several new cooling fan advances buyers can still choose effective cooling solutions even if thermal management is an afterthought.

*By John Knight, vice president, Orion Fans*

More often than not, thermal management is not a primary consideration in the bill of materials (BOM) for your company's next product design. The thermal management afterthought usually creates problems when selecting the most effective cooling solution because it must incorporate any pre-existing physical designs and layout while helping obtain a certain minimum level of performance. However, proper selection of the right thermal management solution can be eased by some of the current trends in cooling product designs.

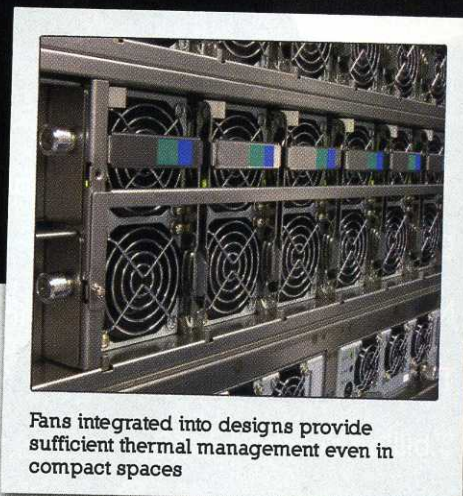


High-performance vane axial fans, such as Orion Fans' VA series, provide significantly higher CFM and pressure ratings in a smaller frame package size than comparable cooling solutions

## Increasing CFM

Technology today is operating at faster speeds than ever before and the miniaturization trend has significantly increased the density and amount of equipment, computer processors and other pieces of heat producing components that can be introduced into an enclosure. The higher operating speeds and higher density of equipment have resulted in significant thermal management challenges.

In order to provide buyers with solutions to these problems, fan manufacturers are increasing their products' cubic feet per minute (CFM) ratings. By increasing the CFM in fans, more air is circulated so the components within the electronic devices (and therefore the enclosed area) are kept within the temperature range that will best maintain the integrity of the overall performance.



Fans integrated into designs provide sufficient thermal management even in compact spaces

Orion Fans' D1N RAIL SPOT COOL fans provide directional and spot cooling in space-constrained applications.

## Maximizing airflow

Specifying fans with a higher CFM is the optimal solution, but there are other recent industry advances that ensure better thermal management without requiring an expensive re-design of the device. These solutions are designed to maximize airflow in very tight, exceptionally high-static-pressure environments such as within telecom networking enclosures and industrial cabinets. Maintaining airflow within an increased static pressure stabilizes the temperature, allowing the electronics to operate at maximum capacity.

Fans designed to maximize airflow provide a significantly higher CFM in a smaller frame package size than comparable cooling solutions. For example, a 60-mm high-performance fan is now capable of providing the airflow equivalent of a standard 80-mm fan, and a 120-mm high performance model is now capable of producing nearly 300 CFM in that same sized package, which would have in the past required a 172-mm fan or larger.

## Fan trays with speed controls

Another trend is thermally-controlled fan trays. Some fan trays are designed to adjust speed in correlation to the air temperature surrounding it, often in the range of 55 to 100 percent of full capacity, to maximize fan life while minimizing noise and saving energy.

Fans or fan trays with thermal speed controls use a thermistor-controlled circuit that increases fan speed when the temperature rises above a determined set point.

Thermistor control circuits can be mounted directly in the fan hub or remotely mounted via a lead wire, and

can be positioned anywhere, giving design engineers the flexibility to regulate fan speed based on ambient temperature in a specific area.

In addition, a constant speed function senses variable input voltage, which can cause variations in power output (and thus fan speed and airflow), and compensates to maintain the fan's constant

speed regardless of input voltage

fluctuations. This "green" option reduces overall energy consumption by automatically lowering fan speed when temperatures within the enclosure fall below a set point, only cooling when and what is necessary.

Certain fan manufacturers like Orion

Fans can provide solutions to its customers by adding or subtracting fan modules in an existing fan tray as thermal management needs change.

## Targeting hot spots

Even with the increased airflow provided by high CFM fans and speed controls, some buyers may still have thermal management issues in certain applications, such as in densely packed industrial enclosures. This means additional cooling may still be required to maintain suitable temperatures in specified areas.

Heat sources such as motors, power supplies, printed circuit boards, and lighting can create "hot spots" within an enclosure or device. To address this issue, airflow should be directed right over the heat source to move the generated heat out of the enclosure or cabinet.

One thermal management solution that specifically addresses this type of problem for automation and control cabinets or enclosures is the SPOT DIN fan available from Orion Fans. The fan is able to produce a maximum airflow of 120 CFM with a speed of 3550 revolutions per minute (RPM) and can be easily and securely fastened with double-sided industrial mounting. Such a solution allows OEMs to deal with troublesome hot spots in an enclosure without major redesigns, field repair costs and machine downtime.

Superior thermal management capabilities through exceptional airflow and innovative designs maximize equipment performance and make fans well-suited for any application requiring an easy and cost-effective method of tackling the thermal management afterthought.

 [www.orionfans.com](http://www.orionfans.com)



Fan trays provide intelligent control and feedback options that maximize energy conservation and improve performance