

# Cooling Fan Development Turns on Application Needs

By David Morrison, Editor in Chief

The need for forced-air cooling is a fact of life in many power-supply applications, and designers depend on that airflow to maximize power density in their products. Many cooling fans are available to create that airflow, and these devices are judged on a variety of performance criteria, including their ability to move air for a given size fan, audible noise output and power consumption.

Some of the recently introduced cooling fan products have been developed with these concerns in mind. Additionally, these newest products offer features such as tachometer output that give system designers greater control over fan operation or design for long life, or the ability to survive in harsh environments.

## Thin Designs

As part of their efforts to provide greater performance in smaller sizes, fan manufacturers are creating very thin fans with high levels of airflow. A recently introduced example is Jaro Thermal's ([www.jarothermal.com](http://www.jarothermal.com)) AS series of Super-Flow-Turbo fans. These "pancake" fans generate 174 cfm of cold air in a thin 25-mm design. To achieve this performance, the fans use a system of aerodynamic blades that are designed and angled to maximize static pressure. At the same time, a slick air-gliding frame adds additional airflow (Fig. 1).

At 120 mm × 120 mm × 25 mm, this fan is suited for server and other applications where high airflow is required. The fan boasts 70,000 hours of life (at 40°C /65% humidity). Options include on-board PWM control, an alarm output,



Fig. 1. Jaro's AS series pancake fans generate 174 cfm of airflow in a thin 25-mm design.

a tachometer output, thermistor control, IP55 protection and a choice of preapplied connector.

The same company also has unveiled a microsized fan for portable applications. Jaro Thermal's Super-Flow Micro fan measures 15 mm (wide) × 15 mm (high) × 4 mm (thin) and spins at 26,000 rpm to produce 0.3 cfm of cooled air (Fig. 2). The fan's combination of small size together with its low operating voltage (2.5 V) and low power consumption (0.2 W) make it appropriate for use in PDAs, cell phones, handheld test equipment, portable power supplies and other space-limited applications. The fan was designed to withstand drop testing of over 7000 Gs and provide a minimum 50,000 hours of product life. Noise level is 30 dB +10% in module. Other specifications can be downloaded at [www.jarothermal.com/cat-DC-FAN-AD1502lx.htm](http://www.jarothermal.com/cat-DC-FAN-AD1502lx.htm).

## Going After Hot Spots

In some applications, there are specific problem areas that need extra airflow. For these applications, a series of plug-in thermally controlled fans from Orion Fans ([www.orionfans.com](http://www.orionfans.com)) offers a convenient approach to cooling. Designed for spot cooling, the new fans can be added to any existing electronic cabinet to direct increased airflow to specific areas that are experiencing elevated temperatures.

These spot-cooling fans are supplied with a standard NEMA 5-15P ac plug-in transformer, giving enclosure manufacturers the ability to add them anywhere within their cabinets without rewiring (Fig. 3).

The spot-cooling fans are available from stock in 92-mm × 25-mm and 120-mm × 32-mm sizes. However, the company notes that it will develop them based on any standard fan size and airflow required by customers.



## Greater Control

A tachometer output is a handy feature

Fig. 2. A combination of small size, low operating voltage and low power consumption make Jaro's Super-Flow Micro fan suitable for use in space-limited applications.



**Fig. 3.** A series of plug-in thermally controlled fans from Orion Fans for spot cooling are supplied with a standard plug-in transformer, giving enclosure manufacturers the ability to add them to their cabinets without rewiring.

for assuring a fan is operating as expected. Orion Fans is now offering this feature on more of the products it makes available from stock.

The company is stocking significant quantities of more than 12 models of its popular dc fan models with a tachometer output, giving them the ability to deliver volume orders directly from stock. The fans include models ranging in size from 25 mm to 172 mm.

“More of our customers are requiring the tachometer output option on dc fans, because they need to be able to monitor the fan performance in their electronic enclosures, and trigger an alarm or indicator if the fan speed falls below a certain rpm,” says Kevin Knight, marketing manager for Orion Fans.

Designed to provide a square-wave frequency equal to two periods per revolution, the tachometer output enables the design engineer to monitor and report the fan’s rotational speed, as well as trigger an alarm signal to indicate that the fan has stopped or slowed significantly. The tachometer output option is available as either a 5-V TTL signal or as an “open-collector” signal, and is available in combination with rotation detection alarm signal options, thermistor speed control, PWM control functions or temperature-sensor controls.

### Harsh Environments

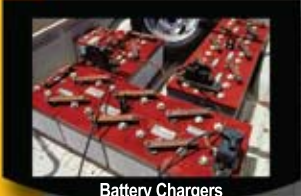
Some fan makers have designed their products to achieve the ratings required for operation in harsh industrial environments. An example is JMC Products ([www.jmcproducts.com](http://www.jmcproducts.com)), which has ex-

panded its product line to include IP54 Series dc cooling fans in sizes ranging from 40 mm through 120 mm. The IP54 Series means the product has been certified to operate in environments with dust particles of less than 75  $\mu\text{m}$  for a minimum of eight hours. In addition, the IP54 rating means the products can withstand water sprayed under pressure of 10 L/min for five minutes while maintaining normal fan operation. This rating assures that the IP54 Series of products are well protected and will continue to operate at full capacity, even in harsh environments. **PETech**


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