S-Force Fans - The Power to Do More

Alan Earls, Contributing Editor -- Design News, September 17, 2008

All fans are not the same. Fan performance is more than simply specifying a certain volume of flow capacity and then hoping for the best. In the real world, most fans can't deliver their theoretical performance. However, ebm-papst has introduced a new line of S-Force tube-axial fans that deliver dramatic and consistent performance.

From the start, motor technology, aerodynamics and electronics were made the foundation of the design of the S-Force fans. For instance, according to Joe Landrette, an engineer with ebm-papst, the new design offers not only improved air handling performance, but also reduced acoustic impact, and improved reliability and efficiency... "All of which are revolutionary improvements in key areas of concern for today's thermal engineers."

The S-Force series is built around compact multi-pole motors that deliver high efficiency with low dissipated energy. In fact, some of the new motors attain a peak power of more than 300 watts. Altogether, the new combinations of motor materials increases fan motor efficiency by 8-11%. Likewise, the S-Force motors offer 400-500% more power handling capabilities compared to fans of just three years ago -- and the more efficient motors and motor cooling technology result in longer life and higher MTBF.

Above all, notes Landrette, S-force fans can offer 40 - 100% more "in system" performance. "Our S-Force show an improvement in free flow measurements compared to earlier fans but it is when they are matched to an enclosure that their performance advantage really becomes apparent," he adds. Unlike most fans, S-Force fans provide a high static pressure, meaning they actually move air in situations where circuitry, cabling and inadequate ventilation openings would stop traditional designs.

"We not only improved the speed and flow of the fan but we optimized its performance by applying computational fluid dynamics (CFD) to improve our results. That high performance and higher pressure capability translates into ample air flow and reliable performance in a wide range of chassis and system configurations.

"There may be a high level of flow resistance but our fan tends to maintain its constant speed and flow all while providing a high degree of fan reliability," adds Landrette.

Beyond sheer performance, the S-Force also offers new or improved capabilities in other areas as well. For instance, the new fan blade geometry - winglets have been added to the blade tips as well as new blade shapes -- offers up to a 6-8dBA noise reduction, which means half the sound power and a 50% reduction in sound level. And, new fan control options are available, too. These features include speed monitoring, closed loop speed control, operation monitoring, integrated or external temperature sensor, or microprocessor-controlled motor management for software-controlled fan operation.

"The S-Series is a tremendous step forward," notes Landrette. Furthermore, he says, "ebm-papst has tremendous expertise in fan control designs, fan tray designs, drop, shock, vibration, climate and acoustic testing, sheet metal capabilities, custom fan designs and even thermal consulting, so we can work with customers to solve any kind of problem."

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