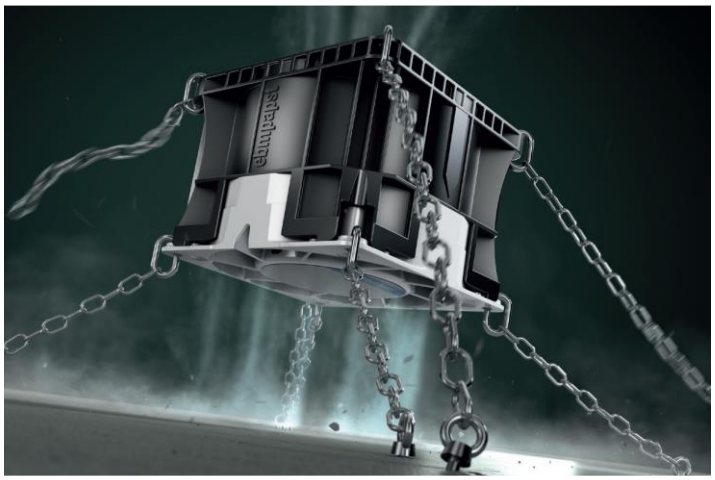
distributor fanmail

ebm-papst Inc. · 100 Hyde Road · Farmington, CT 06034 · USA

Force that can hardly be restrained*:* DiaForce 120 mm

Blowing away counter-rotating fans in terms of power consumption and noise



Introducing DiaForce by ebm-papst – the fan that might literally blow you away!

DiaForce is our latest and most innovative diagonal compact fan, combining the high airflow volume of an axial fan with the high back pressure capabilities of a centrifugal fan. The result? The performance of a counter-rotating fan with less noise and a significant reduction in power.

In today's digitally connected world, we are storing and managing enormous amounts of data. Keeping that data safe and accessible means ensuring the infrastructure needed to support it stays at an optimized temperature. Whether in servers, autonomous technologies, artificial intelligence, or IoT solutions related to 5G, DiaForce delivers the powerful cooling needed with minimal energy consumption and noise, key considerations in this growing industry.

Counter-rotating fans, or two axial fans in series rotating in opposite directions, are often used in these applications. They are known for their high static pressure and ability to cool densely packed electronics in chassis. The electronic components restrict airflow, so that high pressure is needed to ensure uniform cooling throughout the enclosure. The tradeoffs are the energy consumption needed to power the fan coupled with noise. We developed an air mover that delivers the necessary static pressure but with quieter and much more efficient operation.

How did we do this? Through an aerodynamically optimized design featuring unique geometries for both the impeller and housing. The concept is revolutionary - DiaForce draws air in and blows it out both axially and radially while retaining an axial design (favorable for installation). Its cover plate is cut in a conical shape - the intake opening is smaller than the outlet opening – and rotates with it, creating a greater pressure increase than an axial fan could achieve. The blade tips pass directly into the cover plate. As a result, there is no tip gap and therefore hardly any turbulence in the gap area, where there is a considerable pressure gradient. This allows for a noticeable reduction in noise.

These features combine to give DiaForce superior performance to a single-stage axial fan and lower noise than a two-stage axial (2 fans placed on top of each other) or counter-rotating fan – the best of both worlds.

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DiaForce at a glance:

- DiaForce vs Counter-Rotating Fans
  - Comparable performance in airflow and static pressure
  - Significant noise reduction
  - Improved motor efficiency leading to substantial energy savings

- Performance
  - Noise reduction possible from 6 dB(A) - 12dB(A) depending on operating point
  - Steep air performance curve
  - Benchmark in air performance and noise
  - Overall efficiency of 48%
  - Reduced mechanical vibration profile compared to counter-rotating fans

- Technology
  - New and improved aerodynamic design of housing and impeller with optimized guide vanes
  - State-of-the-art motor technology in terms of power and sound
  - Powerful electronics

- Available Options
  - Integrated FanCheck diagnostic tool which calculates the realistic service life of the fan based on temperature, speed, and preset environmental parameters
  - Go/No Go alarm
  - Alarm with speed limit
  - External temperature sensor
  - Internal temperature sensor
  - Analog control input
  - Moisture protection

Target markets / applications

- Server cooling
- Mass storage cooling
- Cabinet cooling
- Autonomous technologies
- Artificial Intelligence (AI)
- Radio Base Station cooling
- 5G / IoT
- **Replacement of noisy two-stage, or counter-rotating, fan designs**

This is the first of multiple releases for this series; we will have subsequent NPIs for our 40 mm and 80 mm models as they become available over the coming year.

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