

Centrifugal fans for efficient precision air-conditioning units A higher air flow thanks to new aerodynamics

Half of the electrical energy required in a data center must be used just for cooling the hardware. At the same time, higher computational capacity over the same floor space is expected, which places additional strain on the cooling systems. In order to satisfy these increasing market requirements, ebm-papst has developed the tried-and-tested series of RadiCal centrifugal fans further.

Precision air-conditioning units are usually deployed in data centers and network control centers, where they provide a constant temperature and air humidity level. The design of the air conditioners significantly influences the choice of suitable fans. In light of the considerably lower back-pressure requirements, these are also required to work at the optimum operating point to ensure that they can run energy-efficiently and save on operating costs.

A higher air flow with a lower head

To fulfill these requirements, the engineers in Mulfingen set their sights firmly on the aerodynamics when overhauling the design. By employing computer-aided optimization methods, the width of the impeller, the size of the intake area, the blade contour and blade thickness were all adapted for a higher air flow with a lower head. As a result, the new RadiCal achieves a maximum efficiency of 68.5 % at an air flow of 13,000 m³/h.

Outer diameter and installation height remain the same

Thanks to lower flow losses in the impeller, lower turbulence and less laminar separation, the fans also have more pleasant noise characteristics. Like its predecessor, the new impeller is made of glass-fiber-reinforced polypropylene. Despite the optimization, the outer diameter and installation height have remained the same, which ensures that the tight installation space in the air conditioners is utilized to best effect.

GreenIntelligence enables preventive maintenance

ebm-papst products with GreenIntelligence have IoT capability and can be interconnected with any system quickly and easily thanks to plug & play. The power electronics integrated into the EC motors enable the speed to be adjusted to meet requirements by means of a 0–10 V control signal or via Modbus RTU. Thanks to Modbus RTU, numerous operating parameters can also be queried and monitored in ongoing operation alongside the control signals. At the same time, recording the operating hours facilitates preventive maintenance for effective minimization of servicing time. The new RadiCal centrifugal fans will be available for all common line voltages and frequencies from early 2019 in sizes 310 and 630.

Katrin Lindner
Trade press coordinator
Phone: +49 7938 81-7006
Fax: +49 7938 81-97006
Katrin.Lindner@de.ebmpapst.com

Corinna Schittenhelm
Trade press coordinator
Phone: +49 7938 81-8125
Fax: +49 7938 81-98125
Corinna.Schittenhelm@de.ebmpapst.com

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Press office contact
ebm-papst Group

Phone +49 7938 81-7105
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www.ebmpapst.com

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Fig. 1: The new RadiCal fans for use in precision air-conditioning units supply a higher air flow with the same outer diameter.

Fig. 1 ebm-papst
Characters Approx. 2,400, including headings and sub-headings
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 aerodynamics, precision air-conditioning unit
Link <https://www.ebmpapst.com/radical>

About ebm-papst

The ebm-papst Group is the world's leading manufacturer of fans and motors. Since it was founded, the technology company has continuously set global industry standards: from the digital interconnection of electronically controlled EC fans to aerodynamic improvements for fan blades to the use of eco-friendly materials.

In fiscal year 2017/18, the company achieved sales of over € 2 billion. ebm-papst employs over 15,000 people at 27 production sites (e.g. in Germany, China and the US) and in 48 sales offices worldwide. Fans and motors from the world market leader are used in many industries, including ventilation, air conditioning and refrigeration, household appliances, heating, automotive and drive engineering.

Katrin Lindner
Trade press coordinator
Phone: +49 7938 81-7006
Fax: +49 7938 81-97006
Katrin.Lindner@de.ebmpapst.com

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