EC centrifugal fans with 3-phase Active PFC. The integrated solution for RadiCal and RadiPac.
Problem …
Where high-performance cooling is required, e.g. in server rooms, use is often made of FanGrids to provide the required cooling capacity. The parallel operation of multiple EC fans can however very quickly lead to the permissible harmonic limit values being exceeded. The problem: The resultant harmonics increase the load on the supply network, and reactive power gives rise to losses. There may also be a negative influence on other devices in the system network. In the past this used to mean: Operators had to fit external harmonic filters, ensure adequate power factor correction and possibly make use of larger cable cross-sections.

… solved.
The good news: External components are now no longer required. To minimize the problem of harmonics with the parallel operation of EC centrifugal fans, ebm-papst has come up with a solution where the harmonic filter is already integrated: namely, Active PFC (Power Factor Correction). Emergency power supplies can be accordingly downsized, thus optimizing costs – a topic of particular importance in connection with FanGrid applications or precision air-conditioning units in data centers.

Six reasons that make us the ideal partner:

**Our systems expertise.** As experts in advanced motor technology, electronics and aerodynamics, we provide system solutions from a single source.

**Our spirit of invention.** Our 600 engineers and technicians will develop a solution that precisely fits your needs.

**Our lead in technology.** Our GreenTech EC technology is setting standards worldwide. And our lead is your competitive advantage.

**Closeness to our customers.** At 49 sales offices worldwide.

**Our standard of quality.** Our quality management is uncompromising, at every step in every process.

**Our sustainable approach.** We assume responsibility with our energy-saving products, environmentally-friendly processes, and social commitment.
The value of the power factor (PF) indicates the extent to which the waveform of the input current matches the ideal waveform, as well as the magnitude of the phase angle between current and voltage. Ideally this would be: PF = 1.0.

THD(I) stands for Total Harmonic Distortion of Current and indicates the amount of current distortion. The value is defined as the quotient (in %) of the rms value of the harmonic currents relative to the fundamental.

**Standard:**
- THD(I) well above the 5% often demanded
- Installation work and extra space are required for additional external filters
- Dimensioning of external filters is difficult

Active PFC converts the pulsed input current of the EC motors into a sinusoidal current. In a second step, the position of the current curve is then shifted so that it is in phase with the voltage. Since the introduction of the standard IEC 61000-3-2 concerning the reduction of current harmonics, Active PFC has become an ever more popular filtering technique for line-operated devices.

**Your benefits:**
- Compliance with technical connection conditions of suppliers
- Better dimensioning of emergency power supply
- Reliable dimensioning of electrical equipment (e.g. fuses, transformers, switches, conductor cross-sections etc.)

**All the advantages at a glance:**
- Minimal current harmonics, even in part load operation
- Problem-free parallel connection of multiple fans
- Perfect interaction of efficient centrifugal fans and electronics with Active PFC
- One product, one supplier – the ideal one-stop solution
- THD(I) ≤ 5% over a broad power range
- No additional wiring work required (“Plug & play”)

**Result:**
With 10–100% rated output, THD(I) is ≤ 5%
The newly developed 3-phase electronics with Active PFC are incorporated in the RadiCal and RadiPac EC centrifugal product ranges. By filtering out the harmonic disturbance, the fans attain excellent power factors of up to $\lambda = 0.99$. In addition, the current peaks are reduced by up to 50%.

Multiple fans can thus be connected in parallel without the need for any additional work. And so EC fans with Active PFC from ebm-papst open up whole new perspectives for your applications.

### Outer dimensions...

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All specifications in mm. Data sheet on request. Data is subject to change without notice at ebm-papst discretion.

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### Would you like to know more?

You can obtain further information on the new innovative Active PFC in 3-phase electronics straight from our experts. We would be delighted to receive your e-mail. Write to info1@de.ebmpapst.com.
Simple installation

- Central terminal area for supply connection, alarm relay, open-loop control and communication
- Safe separation of terminal area and electronics
- High-quality terminals
- No adjustment effort, as motor and control electronics come as a complete package

Flexible open-loop control

- Infinitely variable speed control
- Control signal 0–10 V DC/PWM and MODBUS-RTU
- Open-collector tach signal

RadiPac centrifugal fan

- High efficiency over a broad operating range
- Aerodynamically optimized impeller
- Unrivaled compactness
- Rugged design

Ingenious in every way.
RadiCal centrifugal fan

Perfectly matched components
High efficiency thanks to improved ventilation technology and GreenTech EC motors
Noise reduction thanks to optimized impeller
Unrivaled compactness

With integrated Active PFC
Active power factor correction minimizes harmonic disturbance
Attains power factor of up to $\lambda = 0.99$

Safe operation
Safe shutdown in the event of locked rotor
Optional speed and alarm output
Electronics with degree of protection IP69K
Overvoltage protection
Environment-resistant cable glands
Reverse polarity protection
Integrated locked-rotor and thermal overload protection

Universally deployable
Wide voltage range for use worldwide
Suitable for use with 50 and 60 Hz networks

Efficiency | Power Density | Control | Index | Plug&Play | Compactness | Monitoring | Sustainability
Fan power measurements are carried out on state-of-the-art chamber test rigs. The entire fan unit, consisting of motor, control electronics and impeller, is measured in various load states. This ensures that we obtain reliable data, and that you can count on these values being reached when selecting a fan. Then there is no chance of unpleasant surprises when installing the fans.

The measured data forms the basis for our design program, FanScout, which is available on request.

This software can be used to calculate the expected operating costs or to perform lifecycle cost analyses.

### RadiPac

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