Fans for oil-cooled transformers.

A fresh breeze for transformer cooling.
As a leader in technologies for ventilation and drive engineering, 
ebm-papst is in demand as an engineering partner in many sectors.
With over 15,000 different products, we provide the right solution
for just about any challenge. Our fans and drives are reliable, quiet
and energy-efficient.

Six reasons that make us the ideal partner:

Our systems expertise.
You want the best solution for every project. The entire ventilation
system must thus be considered as a whole. And that’s what we
do – with motor technology that sets standards, sophisticated
electronics and aerodynamic designs – all from a single source
and perfectly matched.

Our spirit of invention.
We are also always able to develop customized solutions for you
with our versatile team of over 600 engineers and technicians.

Our lead in technology.
We are pioneers and leaders in the development of high-efficiency
EC technology. Already today almost our entire product range is
also available with GreenTech EC technology. The list of benefits is
long: higher efficiency, low maintenance, longer service life, sound
reduction, intelligent control characteristics and incomparable
energy efficiency.

Proximity to our customers.
ebm-papst has 25 production locations worldwide (including facilities
in Germany, China and the USA), together with 49 sales offices, each
of which has a dense network of sales representatives and distributors.
You will always have a local contact, someone who speaks your
language and knows your market.

Our standard of quality.
Our quality management is uncompromising, at every step in every
process. This is underscored by our certification according to
international standards including DIN EN ISO 9001, ISO/TS 16949-2
and DIN EN ISO 14001.

Our sustainable approach.
Assuming responsibility for the environment, for our employees and
for society is an integral part of our corporate philosophy. We develop
products with an eye to maximum environmental compatibility,
in particular resource-preserving production methods. We promote
environmental awareness among our young staff and are actively
involved in sporting, cultural activities and education. That’s what
makes us a leading company – and an ideal partner for you.
A well-designed system.
With our fans for oil-cooled transformers, you get a system with perfectly matched components. The fans consist of a HyBlade® impeller, a GreenTech EC motor and electronics or an AC motor, a fan housing and a guard grill for the intake side. They are available in sizes ranging from 500 to 1,250 mm.

All fan designs are based on the requirements of the EN 50216-12 series of European standards, which covers fans for power transformers. The grill provides contact protection as per DIN EN ISO 13857. Their nozzles are made of hot-dip galvanized sheet steel. On the outlet side, they feature an integrated circumferential flange that enables easy, direct attachment to the oil radiator.

Rugged and quiet with open-loop speed control.
Super-efficient motors deliver top performance while consuming very little energy. Aerodynamic optimization reduces air turbulence and minimizes noise. An intelligent electronics ensure the ideal speed at all times for considerable efficiency benefits, especially in partial-load operation. Only the combination of all these features ensures ideal cooling capability, and ultimately a considerably longer transformer service life.

Incidentally, we guarantee that you can rely on our measurements and characteristic fan curves. We always test our fans as complete systems in our ultra-modern test labs under realistic operating conditions. So from us you get “real” measured values and not calculated performance data.

Installing the axial fan in a housing is a perfect way to significantly increase air performance.

A perfect whole.
The venturi housings of our fans provide a crucial advantage. The current industry standard is to operate fans with a basket grill and without housing. In addition, strong turbulence leads to high air performance losses.

As can be seen in the diagrams below, venturi housings provide higher air performance and considerably better system efficiency. When fans are operated wide open (as is typically the case with oil-cooled transformers), the positive effects of a fan housing are enormous.
The efficient heart: our GreenTech EC motor.

One reason for the high efficiency of our fans is their GreenTech EC motors with external rotor design. These are grid-powered, permanently energized synchronous motors with electronic commutation (also called BLDC). Their efficiency is well above efficiency class IE4, but unlike many permanent magnet motors with internal rotor design, they are not subject to the possible supply constraints associated with rare earth magnets.

The EC motors can be used worldwide and have all the required approvals (UL, CSA, EAC, CCC, CE). Not only does attaching the high-performance impeller directly to the rotor of the external rotor motor save space, it also allows the entire rotating assembly to be balanced in a single procedure.

An innovative fan: our HyBlade®.

The HyBlade® impeller consists of a strong aluminum core covered by a layer of fiberglass reinforced moldable plastic. This unique hybrid material design enables aerodynamic optimizations far superior in both noise generation and efficiency to what is achievable with conventional blades. In combination with our GreenTech EC motors, HyBlade® fans become true wonders of efficiency that have proven their reliability in numerous applications worldwide.

HyBlade® – the benefits at a glance:

- Weight reduction
- High-efficiency blade profile
- Noise reduction
- Significant improvement in efficiency
- More environmentally compatible production
- Available with AC and GreenTech EC technology
Fan housing

- **High efficiency**
  - Integrated nozzle on intake side
- **Rugged design**
  - Hot-dip galvanized sheet steel
  - Durable and resistant to salt spray
  - As per DIN EN ISO 12944, class C5M
  - Color RAL 9006 “transformer grey”
- **Safe handling during transport and installation**
  - Motor system and impeller mounted in housing
  - Direct attachment to application
- **Flexible installation**
  - Installation with horizontal and vertical motor shaft
  - Installation on intake and outlet sides
- **Rating label**
  - As per DIN EN 50215-12

HyBlade® impeller

- **Innovative materials**
  - HyBlade® technology with composite materials
  - UV-resistant
- **High efficiency**
  - More efficient than conventional fans due to profiled blade geometry and winglets
- **Low weight**
  - Aluminum core with fiberglass reinforced plastic blade
- **Low noise**
  - Aerodynamically optimized shape for significant noise reduction compared with conventional fans

Economical, quiet and reliable – down to the last screw.
Transformers are increasingly used in the vicinity of residential areas, where strict requirements related to noise must be met. To avoid causing sounds that can disturb residents, noise generation must be minimized. Speed reduction can be used to adjust the noise level to requirements. During the day, the fans and the transformer can work at full power. At night when there is less demand, all of the fans can be operated at partial load.

In conventional systems, individual fans are switched on and off. The fans that are still running continue to work at full power, which is not ideal from the perspective of overall system efficiency. This is where EC technology has a significant advantage.

GreenTech EC fans solve this problem more effectively with smooth speed adjustment at sustained high efficiency, keeping all fans in operation with significant reductions in power consumption AND noise, with a positive impact on the service life of the fans.

A further benefit of partial-load operation is the more uniform air flow through a transformer's radiators, for more economical operation of the entire system and improved life cycle costs.

The diagrams below illustrate the potential energy savings and noise reduction in a comparison of on/off operation and smooth speed adjustment.

**Reduced energy consumption:** The bars show the power consumption of fans that are switched on stepwise as needed. Air performance is reduced by 50% when half of the fans are switched off. The blue line shows the power consumption of all fans with smooth speed adjustment at the required air flow (50% air flow = only 12.5% input power).

**Lower noise generation:** While switching off half the fans (50% decrease in air flow) only reduces noise generation by approx. 3 dB, a speed reduction resulting in 50% less air flow achieves an improvement of 15 dB.
Compact, innovative and loaded with features.

### Nominal data

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<tr>
<th>Size</th>
<th>Article number</th>
<th>Motor</th>
<th>VAC</th>
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<th>rpm</th>
<th>W</th>
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### Size

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1) Available as an option. Data is subject to change without notice at ebm-papst discretion.

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[2] All measured values free air with intake-side contact protection
[3] Speed range 30…100%
You’re at the forefront with GreenTech EC fans.

Air flow and sound pressure level in 2 m in accordance with IEC 60076-10 free air for AC fans.

For other versions and information, or for questions about fan design or specific applications, simply contact your ebm-papst representative. We can also prepare a Product Selector (fan selection software) collection corresponding to your wishes and requirements.