Fans for oil-cooled transformers.

A fresh breeze for transformer cooling.

ebmpapst

The engineer's choice

About ebm-papst.

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.

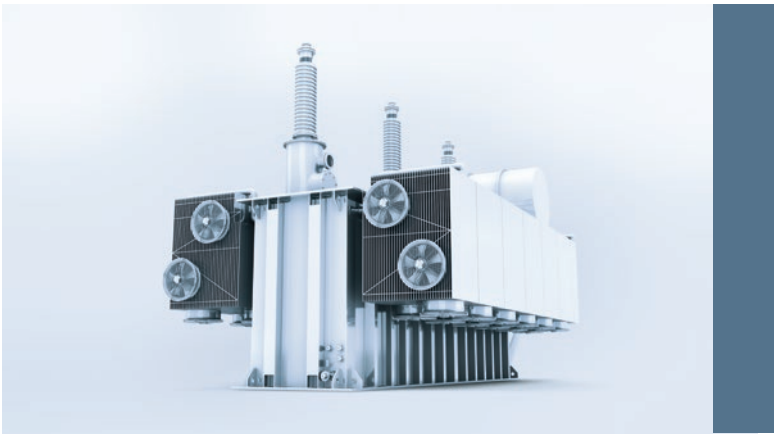
Our standard of quality.
Our quality management is uncompromising, at every step in every process. This is underscored by our certification according to international standards including DIN EN ISO 9001, ISO/TS 16949-2 and DIN EN ISO 14001.

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.

Performance in perfection.
Transformer cooling from ebm-papst.

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.



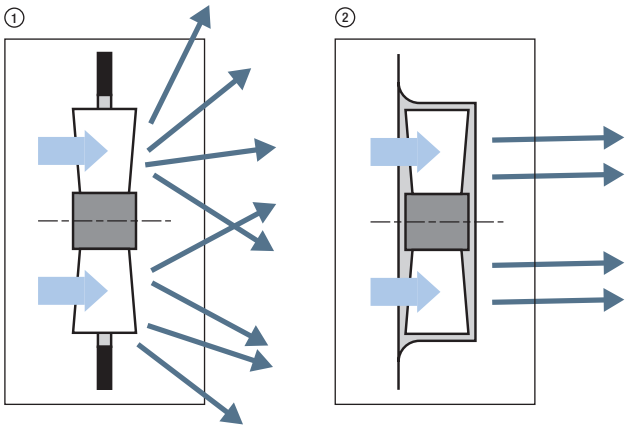
Rugged and quiet with open-loop speed control.
Super-efficient motors deliver top performance while consuming very little energy. Aerodynamic optimization reduces air turbulence and minimizes noise. An intelligent electronics ensure the ideal speed at all times for considerable efficiency benefits, especially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

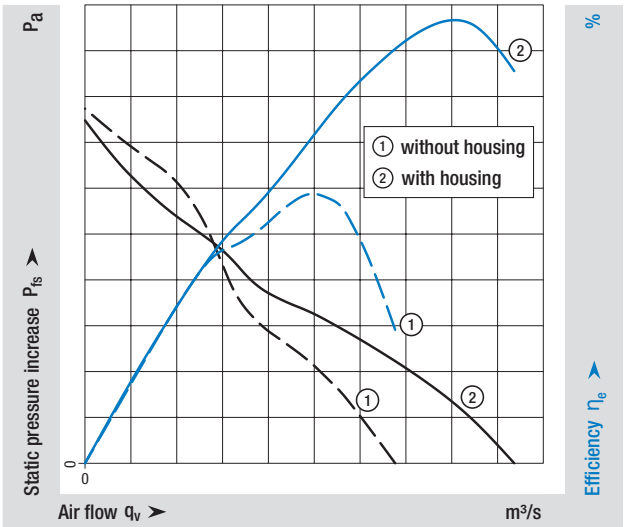
Incidentally, we guarantee that you can rely on our measurements and characteristic fan curves. We always test our fans as complete systems in our ultra-modern test labs under realistic operating conditions. So from us you get “real” measured values and not calculated performance data.

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.

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





Efficiency meets innovation.

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:

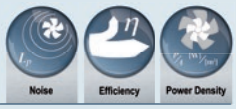
- Weight reduction
- High-efficiency blade profile
- Noise reduction
- Significant improvement in efficiency
- More environmentally compatible production
- Available with AC and GreenTech EC technology

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.

GreenTech EC motor

Low noise emissions
- Commutation and stator design ensure very smooth operation
- Acoustically imperceptible commutation frequency

Extremely energy-efficient
- High efficiency (> IE4)
- ErP-compliant

Economical operation
- Optimized commutation for partial-load operation down to 10 % of rated speed while maintaining high efficiency

Long service life
- Maintenance-free ball bearings
- Brushless commutation

Unrivaled compactness
- External rotor motor integrated in axial impeller

Extremely durable
- IP 55 rating for top protection against splash water

EC electronics

Easy operation
- Central terminal area for power connection, alarm relay, open loop control and communication
- Connection area physically separated from motor electronics
- High-quality terminal clamps
- Pre-set operating parameters

Exact control
- Smoothly adjustable speed
- 0–10 VDC/PWM interface and MODBUS RTU
- Speed control with sensor

Universally deployable
- Different voltage configurations for use worldwide
- For use with 50- and 60-Hz grids

Safe operation
- Integrated derating function
- Integrated locked rotor and thermal overload protection
- Surge-resistant to 6 kV
- Integrated EMC filter and motor protection circuitry

Terminal box
- Externally accessible connectors and interfaces
- Easy wiring
- Generously dimensioned

Intake-side guard grill

Safety
- DIN EN ISO 13857 contact protection

Robust design
- Resistant to salt spray as per DIN EN ISO 12944, class C5M (color RAL 9006 “transformer grey”)

Outlet-side guard grill
- Available as an option

Good to hear.

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.

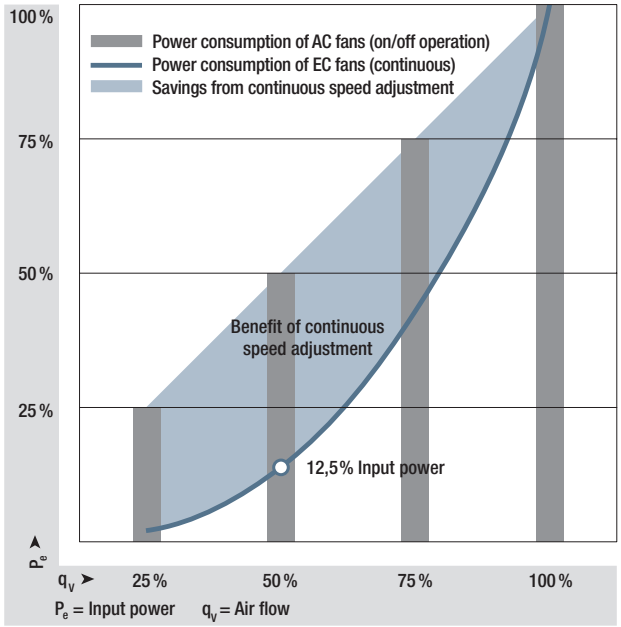
In conventional systems, individual fans are switched on and off. The fans that are still running continue to work at full power, which is not ideal from the perspective of overall system efficiency. This is where EC technology has a significant advantage.

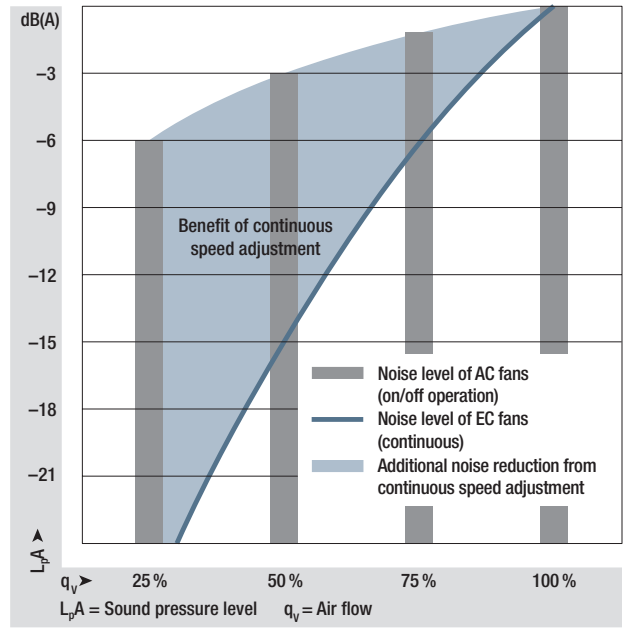
GreenTech EC fans solve this problem more effectively with smooth speed adjustment at sustained high efficiency, keeping all fans in operation with significant reductions in power consumption AND noise, with a positive impact on the service life of the fans.

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.

Energy savings and noise reduction in part load operation.





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.

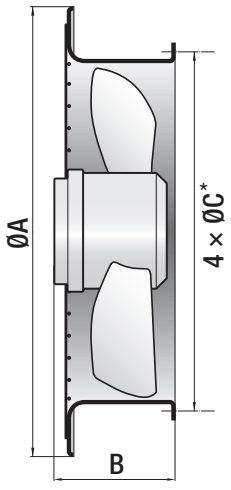
Compact, innovative and loaded with features.

Nominal data			Nominal voltage[1]	Frequency	Nominal speed[2]	Input power[2]	Nominal current[2]	Perm. ambient temperature
Size	**Article number**	**Motor**	**VAC**	**Hz**	**rpm**	**W**	**A (Δ/Y)[1]**	**°C**
500	**W6D 500-CJ01-80**	AC 6pole	230 Δ / 400 Y	50	945	210	1.2/0.7	–40…+65
			277 Δ / 480 Y	60	1,125	325	1.2/0.7	–40…+65
	W4D 500-CM01-80	AC 4pole	230 Δ / 400 Y	50	1,390	530	2.0/1.2	–40…+65
			277 Δ / 480 Y	60	1,640	870	2.5/1.4	–40…+60
	W3G 500-CD63-80	EC	400	50/60	530…1,765[3]	26…960[3]	0.1…1.5[3]	–25…+60
630	**W6D 630-CN09-81**	AC 6pole	230 Δ / 400 Y	50	935	485	2.2/1.3	–40…+60
			277 Δ / 480 Y	60	1,090	790	2.5/1.5	–40…+55
	W4D 630-CI03-80	AC 4pole	230 Δ / 400 Y	50	1,410	1,130	4.2/2.4	–40…+70
			277 Δ / 480 Y	60	1,650	2,000	5.0/2.9	–40…+60
	W3G 630-CG98-80	EC	400	50/60	350…1,160[3]	22…735[3]	0.1…1.2[3]	–25…+65
800	**W8D 800-CD05-80**	AC 8pole	230 Δ / 400 Y	50	685	705	3.6/2.1	–40…+70
			277 Δ / 480 Y	60	810	1,090	4.2/2.4	–40…+70
	W6D 800-CE05-80	AC 6pole	230 Δ / 400 Y	50	940	1,050	5.0/2.9	–40…+80
			277 Δ / 480 Y	60	1,110	1,710	5.7/3.3	–40…+60
	W3G 800-CG02-80	EC	400	50/60	230…775[3]	15…595[3]	0.1…0.9[3]	–25…+65
	W3G 800-CU25-80	EC	400	50/60	310…1,030[3]	45…1,765[3]	0.1…2.7[3]	–25…+70
910	**W8D 910-CE07-80**	AC 8pole	230 Δ / 400 Y	50	700	680	3.8/2.2	–40…+80
			277 Δ / 480 Y	60	820	1,070	4.2/2.4	–40…+60
	W6D 910-CB05-80	AC 6pole	230 Δ / 400 Y	50	950	1,510	7.2/4.2	–40…+70
			277 Δ / 480 Y	60	1,120	2,440	8.1/4.7	–40…+45
	W3G 910-CG06-80	EC	400	50/60	200…650[3]	15…480[3]	0.1…0.9[3]	–25…+60
	W3G 910-CU22-80	EC	400	50/60	265…885[3]	40…1,515[3]	0.1…2.4[3]	–25…+60
990	**W8D 990-CE05-80**	AC 8pole	230 Δ / 400 Y	50	670	900	4.1/2.3	–40…+70
			277 Δ / 480 Y	60	770	1,420	4.8/2.7	–40…+50
	W6D 990-CX01-80	AC 6pole	230 Δ / 400 Y	50	940	1,940	7.9/4.6	–40…+60
	W6D 990-CY03-80		277 Δ / 480 Y	60	1,140	2,540	9.0/5.2	–40…+50
	W3G 990-CU28-80	EC	400	50/60	225…750[3]	355…1,315[3]	0.1…2.1[3]	–25…+60
1,250	**W3G Z50-CK15-80**	EC	400	50/60	180…600[3]	45…1,705[3]	0.1… 2.7[3]	–25…+65

[1] Nominal voltage range: AC motor: 3~ 208–277 V Δ / 380–480 V Y 50/60 Hz; EC motor: 380–480 V 50/60 Hz Y: AC motor star circuit diagram; Δ: AC motor delta circuit diagram;
[2] All measured values free air with intake-side contact protection [3] Speed range 30–100 %

Size	Article number	Motor	A	B	C	Outlet-side guard grill[1]
500	**W6D 500-CJ01-80**	AC 6pole	660	268	541	40500-2-4039
	W4D 500-CM01-80	AC 4pole	660	268	541	
	W3G 500-CD63-80	EC	660	275	541	
630	**W6D 630-CN09-81**	AC 6pole	800	263	674	40630-2-4039
	W4D 630-CI03-80	AC 4pole	800	332	674	
	W3G 630-CG98-80	EC	800	315	674	
800	**W8D 800-CD05-80**	AC 8pole	1,000	326	837	40800-2-4039
	W6D 800-CE05-80	AC 6pole	1,000	326	837	
	W3G 800-CG02-80	EC	1,000	335	837	
	W3G 800-CU25-80	EC	1,000	333	837	
910	**W8D 910-CE07-80**	AC 8pole	1,120	328	956	40910-2-4039
	W6D 910-CB05-80	AC 6pole	1,120	329	956	
	W3G 910-CG06-80	EC	1,120	339	956	
	W3G 910-CU22-80	EC	1,120	344	956	
990	**W8D 990-CE05-80**	AC 8pole	1,185	335	1,043	40990-2-4039
	W6D 990-CX01-80 **W6D 990-CY03-80**	AC 6pole	1,185	335	1,043	
	W3G 990-CU28-80	EC	1,185	333	1,043	
1,250	**W3G Z50-CK15-80**	EC	1,560	324	1,380	–

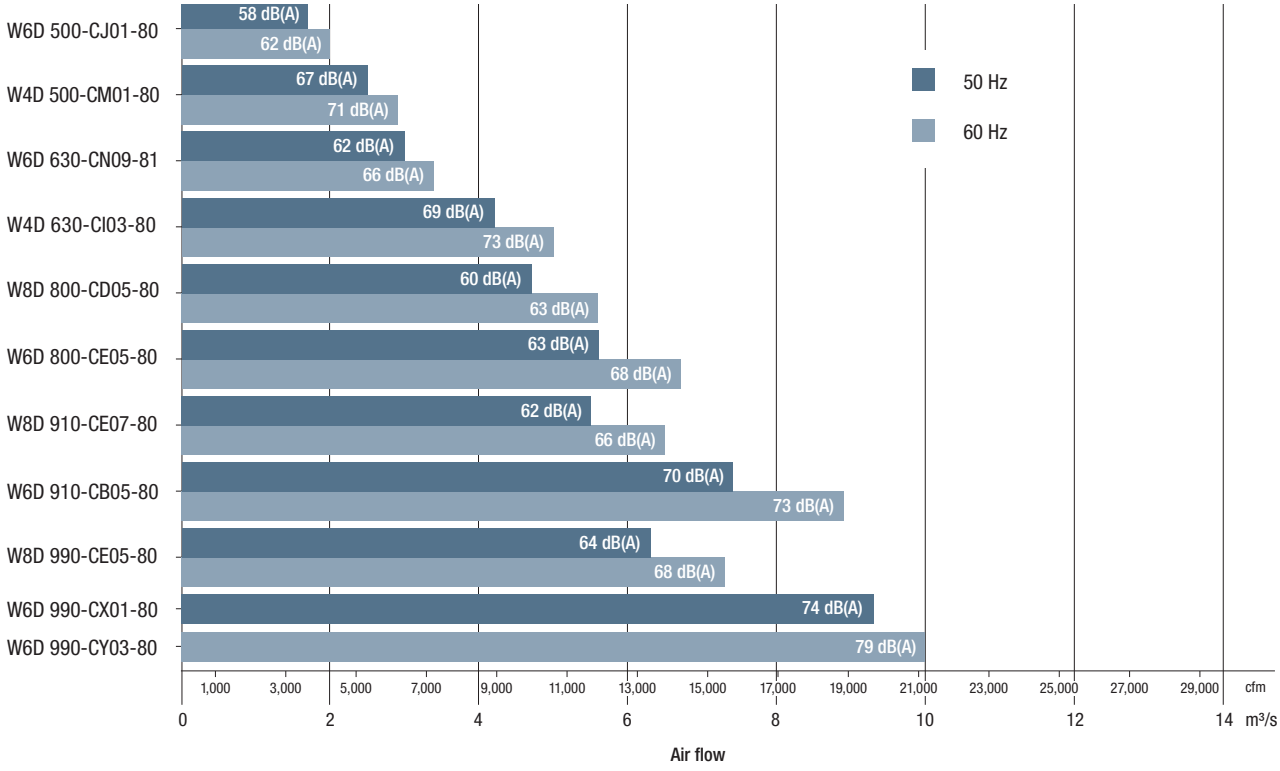
[1] Available as an option. Data is subject to change without notice at ebm-papst discretion.



*Mounting bolt circle

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.



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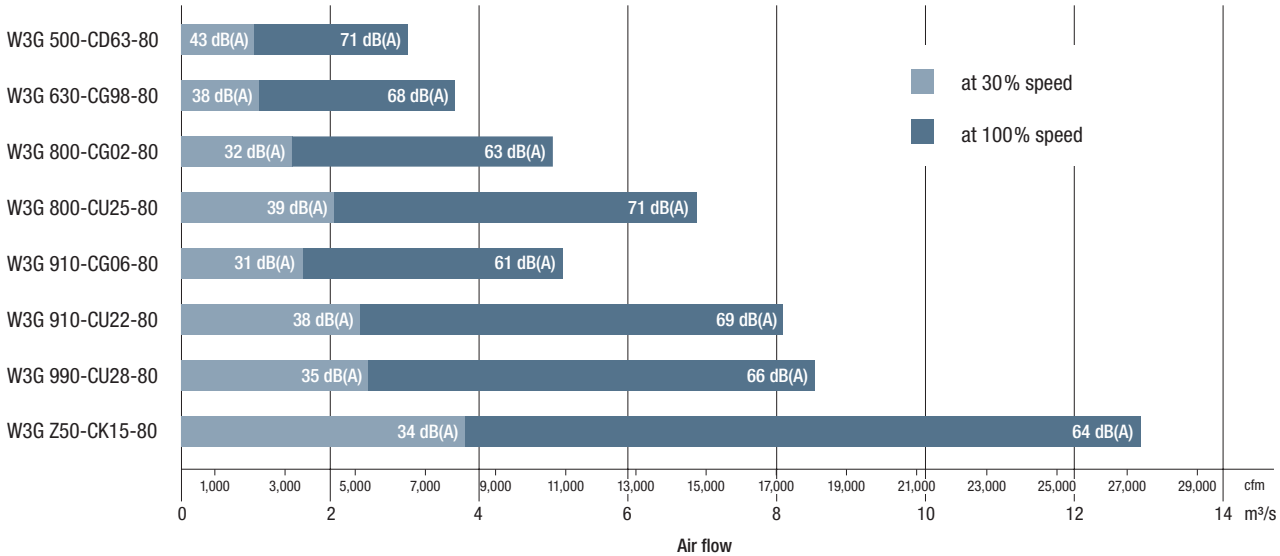

For other versions and information, or for questions about fan design or specific applications, simply contact your ebm-papst representative. We can also prepare a Product Selector (fan selection software) collection corresponding to your wishes and requirements.

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The engineer's choice