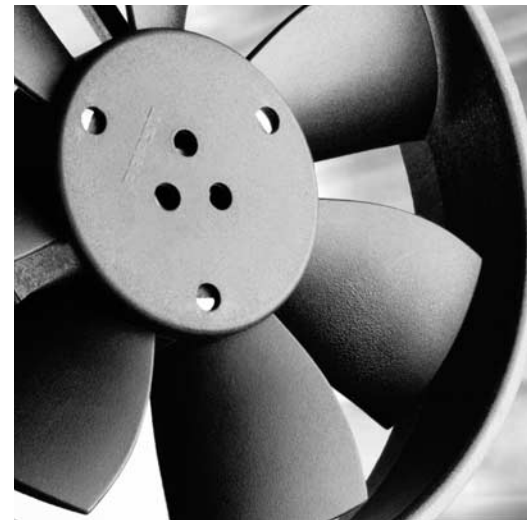
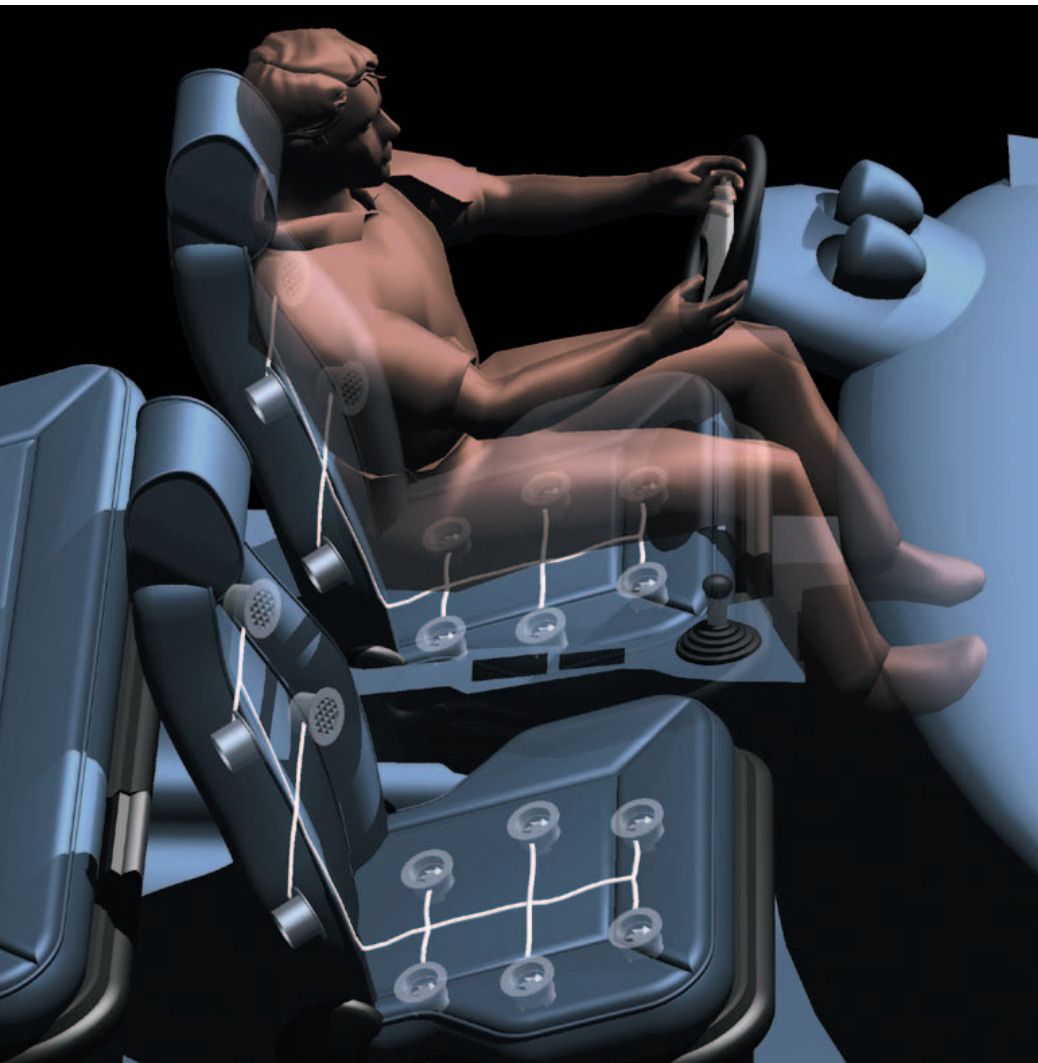


Seat ventilation

Fans and ventilators
for the ultimate
in seating comfort



Secure your spot in a market of the future

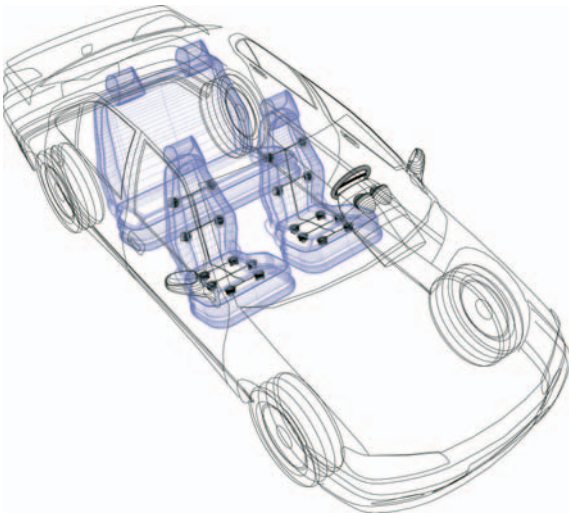
ebmpapst

Why being the best is so important



Maximizing our potential together

If you want to create new business and give your customers a good reason to do business with you, you need outstanding innovations that are more than just hot air. That's why you should choose ventilators and fans from ebm-papst – one of the world's leading companies in this field. Our people have the expertise and unwavering enthusiasm to develop new concepts in vehicle comfort. Now you can join us in an effective partnership to maximize the enormous potential available.



ebm-papst – a worldwide breath of fresh air

As the world's market leader in ventilators and fans, ebm-papst specializes in electrical drive systems and motors. Besides high-tech drives, we have over 7,000 employees in Germany and around the world who develop, produce and market one of the most comprehensive ranges of fans available.

Thanks to our unbeatable capacity for innovation, we can offer our partners a unique perspective when it comes to vehicle components involving air and drive technology. Today, ebm-papst is a major player in automobile construction offering a wide variety of components and systems.

With components and modules for seat air conditioning, electronic assembly cooling, air conditioning and cooling systems for vehicles and with actuators and drive systems for all kinds of auxiliary functions – some vehicles contain up to 40 of our motors or fans.



The ultimate in seating comfort is not a question of luxury...



... but having the right concepts

There's no doubt that good seating has been available for years. But, of course, this doesn't mean it can't be significantly improved. This is the job we do every day, for the benefit of you and your customers. However, while we focus on the details, we never lose sight of the big picture, which means we can open up new markets with remarkable growth potential. That's why the ultimate in seating comfort is not a question of luxury but more than anything, of making the right decision.



Recognize the opportunities and act accordingly

The demand for seating comfort is growing – in cars as well as trucks and other commercial vehicles. This is hardly surprising when you consider that no other component is as large or in contact with the occupants as long as the seats. While it is predominantly luxury cars that have been equipped with seat ventilation, there's now a clear trend toward this feature becoming available in mid-range and compact cars.

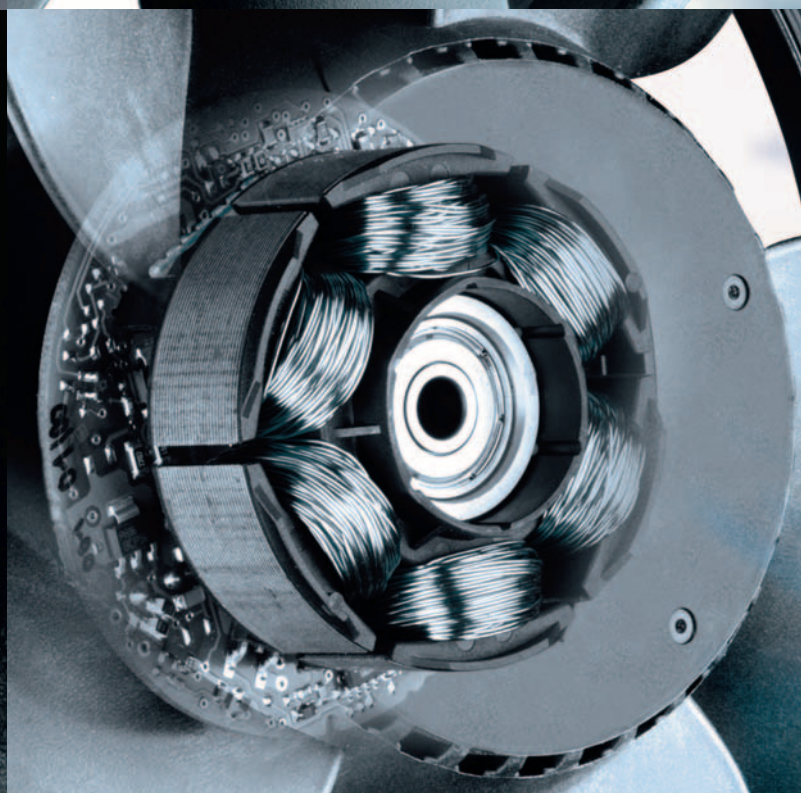
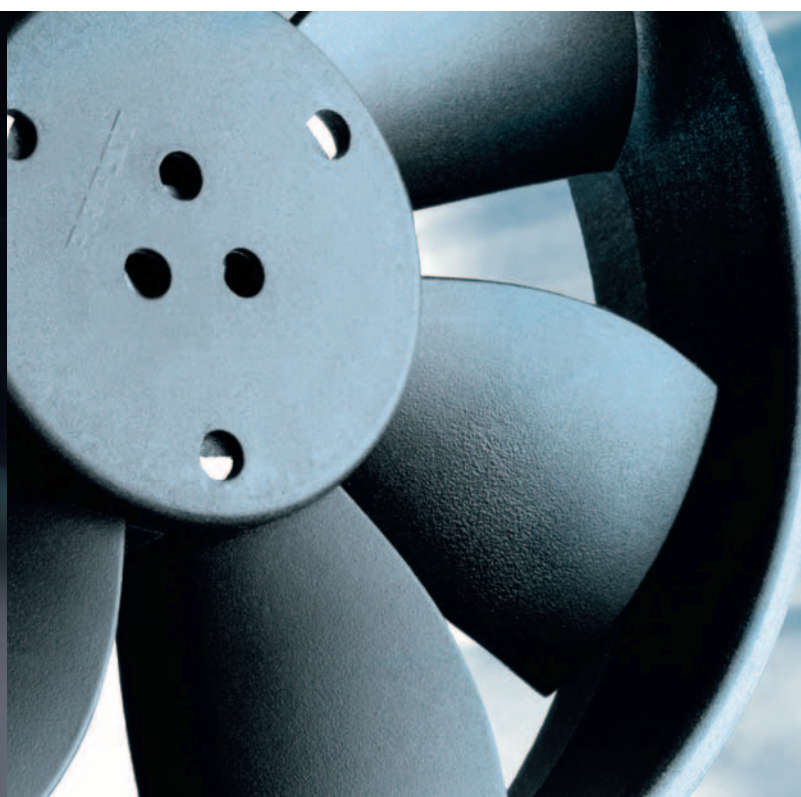
But it is not just tougher competition that is compelling vehicle manufacturers and system suppliers to provide increasingly high standards of equipment: rather, there are sound arguments for insisting on higher standards – ultimately seat ventilation, with its microclimate that maintains the well-being of long-distance drivers in particular, offers considerable benefits and added value.

New ideas in practice get the market moving

Regardless of whether you expect cars or commercial vehicles to profit first from the trend toward improving equipment levels, every seat producer knows this is not merely idle speculation about some theoretically possible advance in the distant future. We're talking about a market reality whose features are clearly discernible today.



Quality is in the detail



Consider some great prospects

If you're market savvy, you know that only quality can give you the edge you need as competition gets tougher. Quality from ebm-papst not only means compliance with regulations but setting new standards. With our ventilation technology you can offer your customers a level of reliability and comfort that will ensure long-term and repeat business.

Demand the best and take the lead

What makes our products so economical and the ideal choice for auto manufacturers and vehicle seat suppliers? Essentially, it's a winning combination: they work exceptionally well, they're totally reliable and they're built to last.

Every one of our ventilation systems is an expression of our striving for perfection that would be impossible to achieve without our enthusiasm for this technology. When it comes to ventilation of the upholstery and backs of driver and passenger seats, it's the details added together that provide the crucial added value – from the design drawing and choice of materials, the approved suppliers and component producers we work with, to the final assembly.

Quality management for breakthrough products and services

Together with our customers, we determine and evaluate every application according to technical, logistical and economic requirements and implement these in our quality products. Our compliance with international standards DIN ISO EN 9000, ISO/TS 16949, VDA 6.1, QS 9000, and cooperation with all the major automobile manufacturers show the full extent of our quality management system.

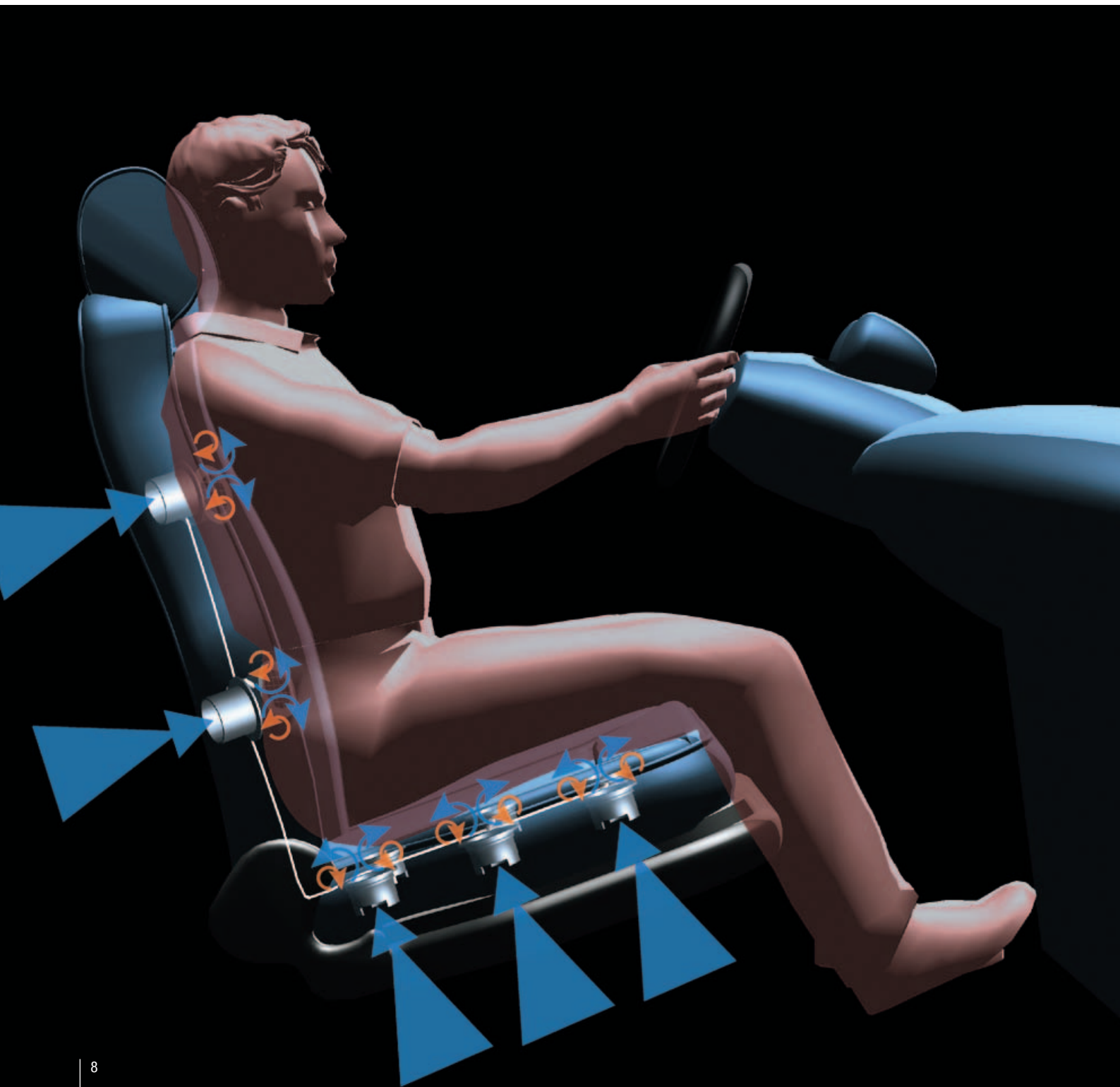


What do you hear? The answer is virtually nothing. An ebm-papst fan is designed to ensure comfortable cooling and first-class seating comfort.

Our testing and measuring lab for economical solutions

We use state of the art simulation tools to implement development and production processes based on the simultaneous engineering principle. Our guidelines for error prevention, constant improvement and comprehensive quality also optimize the product life cycle – many processes and procedures are designed in such a way that they exceed the stipulated quality standards.

Making it more than just a comfortable seat



We have it all under control

Despite technology, the essential element for us is people – this important fact keeps us motivated and keen to continue searching for new ideas. With our ventilation technology you can offer your customers far more than just a comfortable seat: no-one who has ever driven with this intelligent air conditioning technology would willingly forgo its invigorating effects.

Our arguments speak for themselves – and for you

The main purpose of seat ventilation is to prevent perspiring occupants from feeling uncomfortable by sticking to leather-covered seats, for example. At the same time, thermal regulation creates an agreeable microclimate that keeps the driver comfortable longer.

The processes that take place where the seat and occupant are in contact are vitally important for efficient moisture removal. The surface of the seat receives no direct airflow, only ventilation from behind. In order to allow the airflow here to run parallel to the seat surface, the structure below the seat cover must also be sufficiently permeable.

The picture below shows a configuration with eight fans on the Mercedes SL driver's seat, where the fans draw in air from below or, in the case of the seat back, from behind and blow it out over the two exposed seat surfaces. A reverse flow of direction can also be achieved without any major difference in the resulting flow volume.

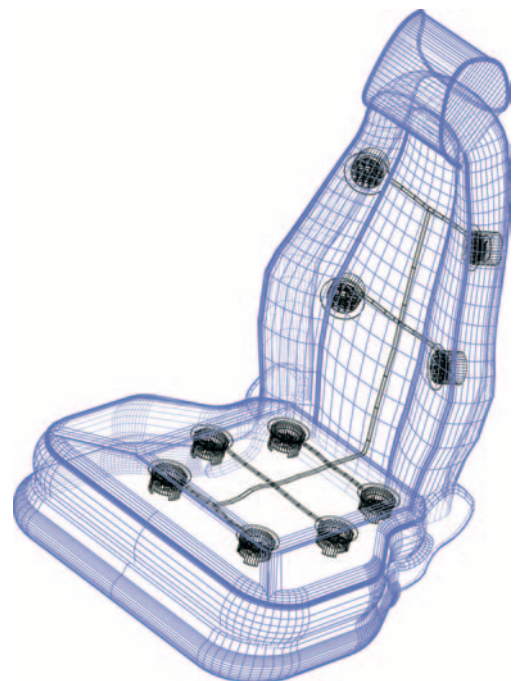


We provide ready-made fan units, including a fan regulatory system, for optimum seat air conditioning. The picture above shows a special solution with six small axial fans with soft suspension and the appropriate wiring. The output of these fans can be individually adapted to passenger cooling requirements – and those of car manufacturers. The real challenge was not only to make them quiet, but also to develop products that can withstand the rigors of seat use.



Optimum airflow volume is also very important in seat ventilation. Axial, radial and diagonal fans are available, which can operate to full capacity depending on their purpose and application. Volume flow, pressure buildup and noise development are all monitored.

When installing fans, they are always distinguished by their type and number. In seats and backs one or more fans are arranged in such a way that the airflow they generate leads to the removal of moisture and evaporation.



The innovative way to arrive in style



We're here to exceed your expectations

Innovation is our business. But only in practical use do our innovations prove their real value.

At ebm-papst we're not just good at dreaming up ideas, but we have the expertise to provide real market-oriented solutions for our customers and business partners.

One example: a completely new type of head area ventilation

Think you can only drive a convertible in spring and summer? Not any more – thanks to our Airscarf head area heating system. Jointly developed by Mercedes-Benz, catem and ebm-papst engineers, this system offers drivers of convertibles unprecedented comfort, especially in the cooler seasons.

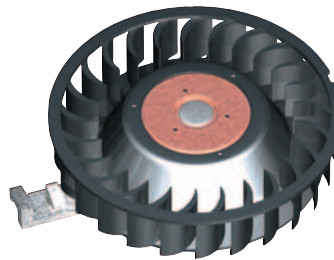
The system is used in the new Mercedes-Benz SLK, which puts it in a different league than its predecessors in terms of climate comfort. At the touch of a button warm air flows from special ventilation openings in the headrests. An ebm-papst fan transports the air via a catem heating channel into the headrest, where it flows out of special ventilation ducts to warm the neck, throat and head of the SLK driver or passenger. It's certainly the most pleasant way to cope with drafts or chilly temperatures outside.

Profitable partnerships all the way

For Mercedes-Benz and catem to work with us, the decisive factor proved to be our wealth of experience in the development and manufacture of fan motors for serial vehicles and various other challenging projects.

The main challenge for the ventilator developers in creating the fans for Airscarf was to construct a quiet, powerful and compact fan that would meet the environmental and operating conditions specific to the automotive sector.

It was also vital to keep the air power of the fans stable during operation, which was achieved by regulating the motor's speed internally.



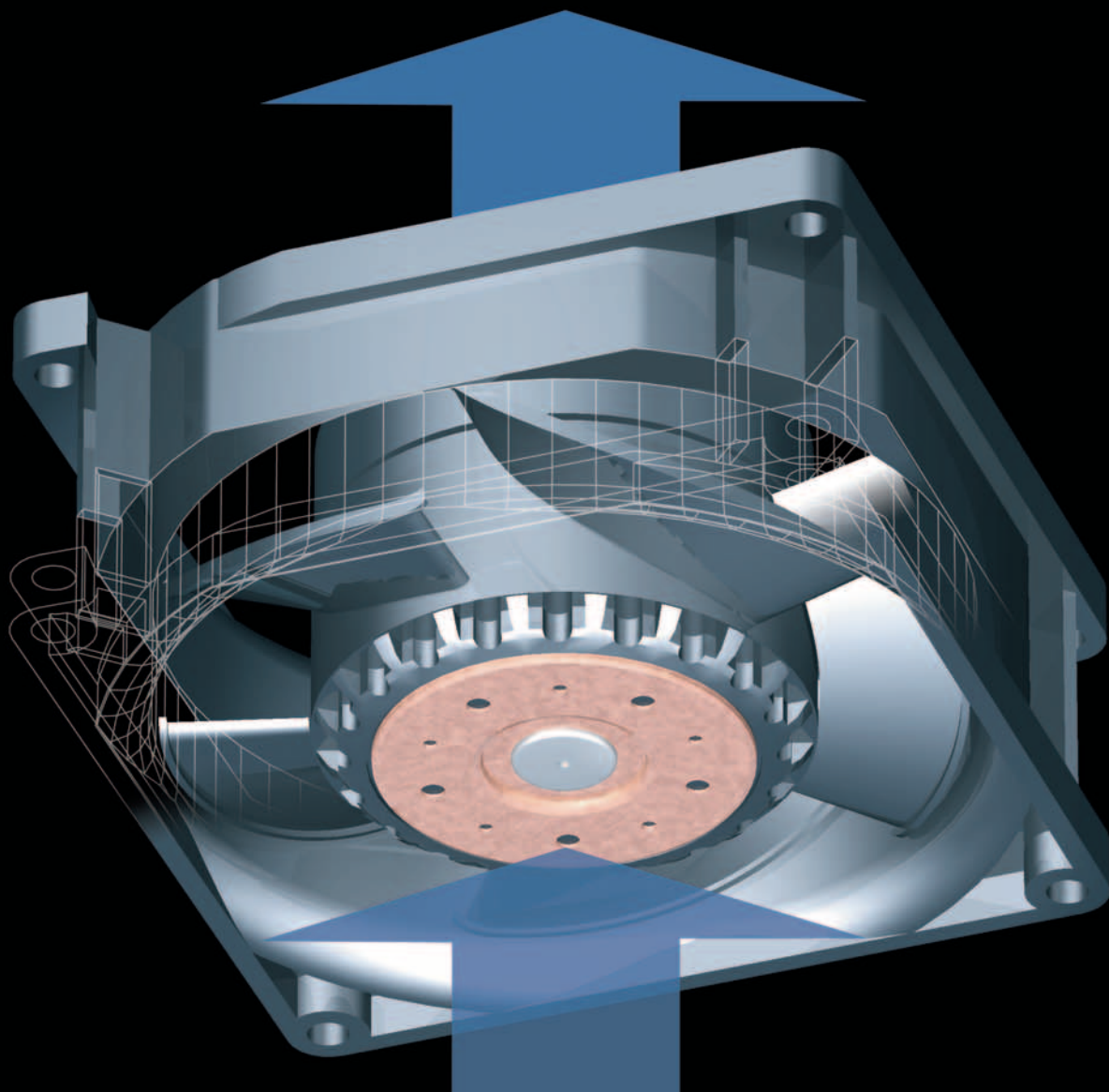
ebm-papst fan motor

How it works

The Airscarf fan module is an integrated system consisting of a fan motor, heating, fans and air outlet channels, as well as a control device. The system starts at the press of a button; there are three heating and ventilation levels. Airscarf continuously adapts the rotational speed of the fans to the external temperature and speed of the car.



A breath of fresh air: axial fans



The axial principle involves high volume airflow with moderate pressure build-up. The through flow of the propeller-like running wheel is largely parallel to the axis of rotation, i.e. in an axial direction. Free blowing, and with a static pressure of zero, axial fans have minimum power consumption that rises with increasing counter-pressure.

All ebm-papst axial fans for seat ventilation are driven by friction-free electronically commutated DC motors. The commutation electronics are integrated within the motor hub of every fan. When mounted in the seat, this compact design saves a great deal of space. The rotational speed of the drives can be regulated and monitored via a sensor signal.

Versatile technology that's so effective

Compact, efficient and proven in practice over many years: ebm-papst axial fans are the original and best in seat ventilation – because they're so versatile, reliable and smart. With their durable, straightforward technology, axial fans can be perfectly integrated, ensuring a whisper-quiet fresh breeze – for the entire life of the vehicle.

Choose from two ventilation designs:

- Multi-point ventilation with several small, quiet axial fans for each seat and back, enabling very finely spaced, individually adjustable climate zones at the seat surface.
- Large-area seat ventilation with larger individual axial fans. Wiring and installation costs are lower with this solution.

Axial fans for seat ventilation are equipped with external housings. The type of attachment can be adapted to any seat design and is determined in consultation with the seat producer in each case.

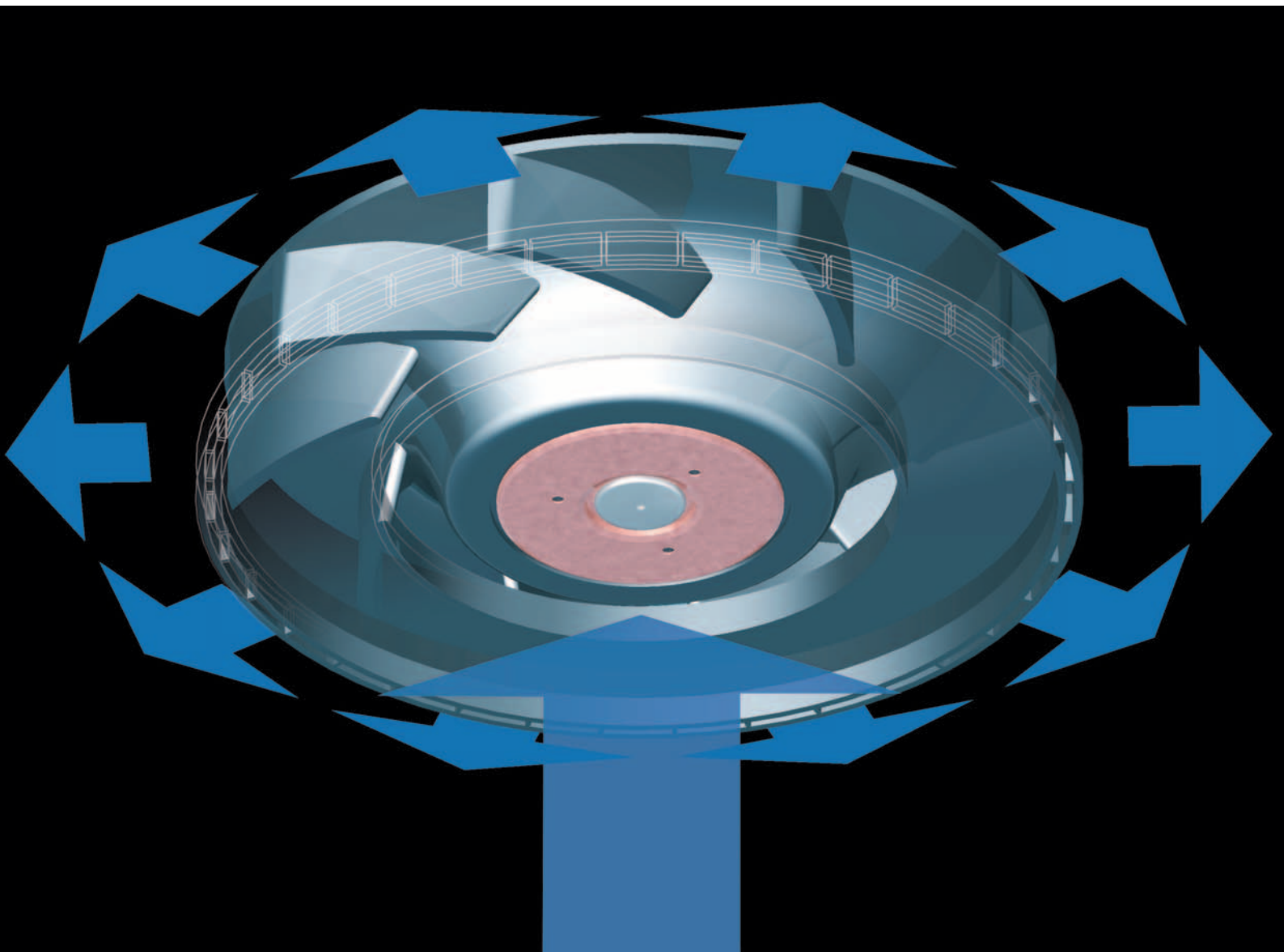
Overview of axial fans:

- DC motors with electronic commutation
- Low noise levels thanks to special electronic commutation
- Electronic anti-locking system and reverse-polarity protection
- External rpm definition via PWM signal
- External rpm control or regulatory electronics
- Rpm definition and diagnostic function via a shared wire
- EMC protection. Suitable for direct connection to the vehicle's electrical system
- Glass fiber reinforced plastic fans
- Fan unit or module assembled and ready to install
- Various mounting options for soft suspension in seat upholstery



Nominal data	Size	Voltage range	Operating voltage	Power consumption	Rotational speed	Volume flow	Power build-up	Acoustic pressure	Temperature range	Lifetime	Bearing system
Type	mm	V DC	V DC	W	R.p.m.	l/s	Pa	dB(A)	°C	Hours	
400 Series	40	10...14	12	1.0	6000	2.8	40	18	-40...+70	> 5,000	Ball bearings/ Sintec sliding bearings
500 Series	50	10...13	12	1.0	5000	5.5	32	30			
600F Series	60	10...13	12	1.5	4500	9.0	30	30			
700F Series	70	8...14	12	1.7	5300	12.0	65	38			
8400N Series	80	9...15	12	1.2	3800	13.0	50	45			

Get your second wind: radial fans



There are no limits in principle to the application options for radial fans. They are, however, particularly well suited to seat ventilation with air guidance channels, whereby the fans ventilate the seat area from well below the surface of the seat. ebm-papst radial fans are also used to ventilate the head area – e.g. the Airscarf system in the new SLK seat.

Here the airflow is generated by a radial fan mounted below the headrest and then guided to the head area via special air ducts. Ideal areas of application for radial fans with 90° air deflection are where very limited space is available and where narrow and/or long air guidance channels are necessary – with very high demands on the pressure generated by the fan.

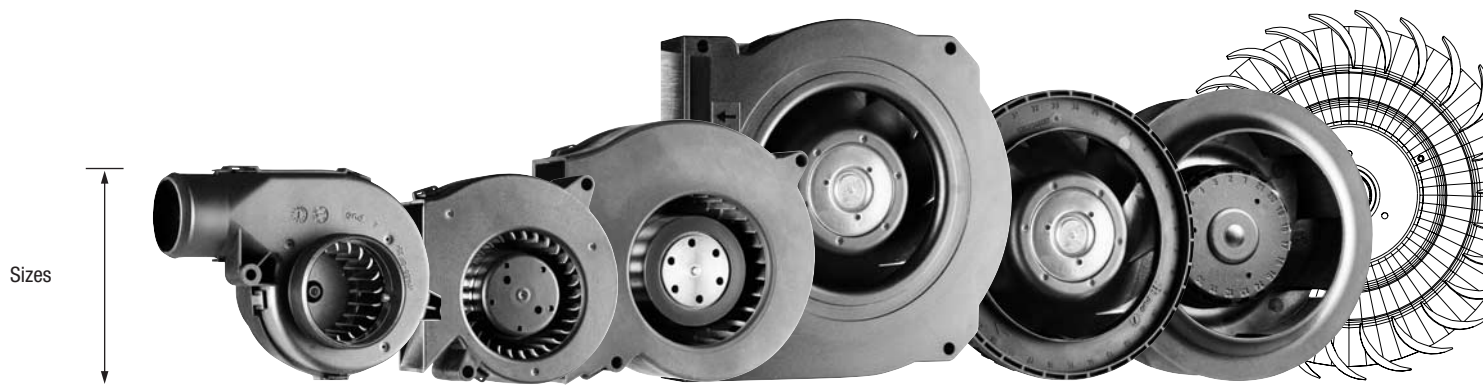
Fresh air – anywhere

Radial fans are the supreme high-pressure specialists in a radial design with 90° air deflection. Equipped with complex optimized running wheels and aerodynamically designed for the high pressures required in seat ventilation, radial fans are used especially for applications with single fan solutions, i.e. if just one fan module per seat or back is appropriate.

All ebm-papst seat ventilation radial fans are driven by friction-free electronically commutated DC motors. The commutation electronics are integrated within the motor hub of every fan. When mounted in the seat, this compact design saves a great deal of space. The rotational speed of the drives can be regulated and monitored via a sensor signal. ebm-papst radial fans are supplied with an external housing and/or separate complete air guidance modules that are used as finished components in the application. The aerodynamic structure of the entire system is examined with modern simulation tools and uniformly implemented at ebm-papst – if requested, as solutions ready for customers to plug-in.

Overview of radial fans:

- DC motors with electronic commutation
- Low noise levels thanks to special electronic commutation
- Electronic anti-locking system and reverse-polarity protection
- External rpm definition via PWM signal
- External rpm control or regulatory electronics
- Rpm definition and diagnostic function via a shared wire
- EMC protection. Suitable for direct connection to the vehicle's electrical system
- Glass fiber reinforced plastic fans
- Fan unit or module assembled and ready to install
- Supplied as running wheel without external housing or as complete module
- Various mounting options for soft suspension in seat upholstery



Nominal data	Size	Voltage range	Operating voltage	Power consumption	Rotational speed	Volume flow	Power build-up	Spiral housing	Temperature range	Lifetime	Bearing system
Type	mm	V DC	V DC	W	R.p.m.	l/s	Pa		°C	Hours	
RV40 Series	60	9...16	12	4.5	5000	8.0	150	yes	-40...+70	> 5,000	Ball bearings/ Sintec sliding bearings
RL48 Series	76	8...15	12	5.0	4400	8.0	150	yes			
RL65 Series	93	8...12	12	12.0	4600	15.0	260	yes			
RLF100 Series	127	8...15	12	8.0	5100	18.0	450	yes			
RER100 Series	Ø100	8...15	12	7.0	5400	24.0	350	no			
RER101 Series	Ø101	9...14	12	23.0	6100	53.0	500	no			

Find out more by ordering these brochures:

- *Corporate profile/ facts and figures*
- *Automotive brochure*
- *Fan and drive system catalogues*

If you're considering a new project that requires the most advanced motors and fans, why not discuss your options with ebm-papst? We look forward to hearing from you.

ebm-papst
St. Georgen GmbH & Co. KG

Hermann-Papst-Strasse 1
D-78112 St. Georgen
Phone +49 (0) 7724/81-0
Fax +49 (0) 7724/81-1309
info2@de.ebmpapst.com

www.ebmpapst.com/de