

## Product overview.

# ebm papst

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 interrelationships between ventilation and drive engineering 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. These system solutions release unique synergies worldwide. And in particular – they relieve you of a lot of work, so that you can concentrate on your core competency.

### The ebm-papst spirit of invention.

In addition to our wide range of products, we are always able to develop customized solutions for you. A diversified team of 600 engineers and technicians works at our three locations in Germany: Mulfingen, Landshut and St. Georgen. Contact us to discuss your next project.

### Our lead in technology.

As pioneer and trail-blazer for developing highly efficient EC technology, we are way ahead of other motor manufacturers. Almost our entire product range is also available with GreenTech EC technology. The list of benefits is long: higher efficiency, maintenance-free, longer service life, sound reduction, intelligent control characteristics and incomparable energy efficiency with savings of up to 80 % compared to conventional AC technology. Let our technology be your competitive advantage as you lead in your industry.

### Proximity to our customers.

ebm-papst owns 57 sales offices worldwide, of which 47 are subsidiaries with an extensive 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.

Of course you can rely on the highest standards of quality with our products. 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.

## The story of our success to market and technology pioneer.

- 1963** Founding of **Elektrobau Mulfingen GmbH & Co. KG** by Gerhard Sturm and Heinz Ziehl.
- 1965** First tubeaxial fan developed in EC/DC technology.
- 1966** ebm-papst's success takes off with the new 68 motor.
- 1972** The first ebm-papst foreign subsidiary is established in Sweden.
- 1988** Gerhard Sturm is awarded the Federal Cross of Merit.
- 1990** The sixty-millionth external-rotor fan is produced.
- 1992** Acquisition of **PAPST Motoren GmbH** in St. Georgen.
- 1997** Buyout of the **Landshut** (mvl) plant.
- 1998** Development of first fans with integrated electronics.
- 2003** Change of name to **ebm-papst**.
- 2008** The **HyBlade®** range of fans sets new efficiency standards.
- 2010** **GreenTech** – our sign for energy efficiency and resource preservation.
- 2011** **RadiCal** defines a new standard for EC centrifugal fans.
- 2013** ebm-papst takes over the gearbox specialist Zeitlauf and wins the **German Sustainability Award**.
- 2014** Team partnership with Mercedes AMG PETRONAS Formula 1 team.
- 2015** **RadiPac** pushes the limits of efficiency.





Three core competencies,  
one unmatched synergy.



**The exceptional system solution needs three things.**

**Innovative motor technology:**

Our external rotor motor has long been well known among specialists – quiet, powerful and continuously evolving, it has made us the world market leader. With its remarkable versatility for integration, it is ideally suited to the most diverse applications. Which has given us the world's widest range of fan and motor types – perfectly complemented by our internal rotor motors for dynamic applications or particularly chemically aggressive air.



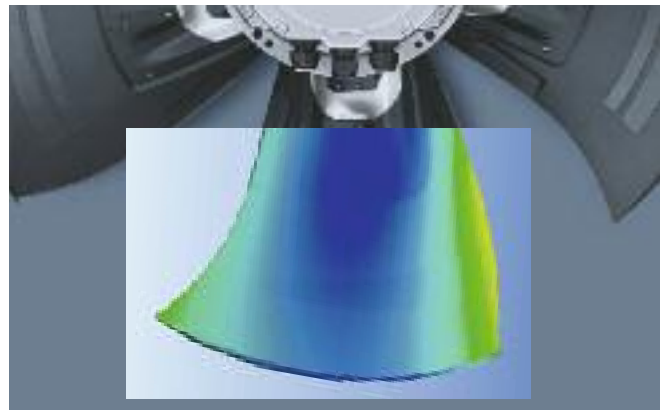
**Intelligent electronics:**

The brain of every state-of-the-art system solution. With the electronics as the controlling element, the drive engineering and aerodynamics are matched perfectly and deployed in a manner customised to the application – manually controlled or automated. Altogether, the result is high-quality end products from a single source – from highly focused electronics cooling to the energy-saving heating system.



**Aerodynamics that thinks along with you:**

The optimum shape is essential, whether for axial or centrifugal fans, centrifugal blowers, compact fans or tangential blowers. Therefore, we always design fan blades, impellers and ducted housings in the corresponding application-specific environment. Only in this way do we attain the greatest possible efficiency with maximum noise reduction. In short: Aerodynamics in perfection.



# Axial fans.



*ebm-papst's axial fans prove their reputation as space-saving wonders by moving air for hot or cold air exchange in a wide variety of devices and systems. Their outstanding features are their small installation depth, low noise level and exceptional efficiency, and they are particularly well suited for air flow through heat exchangers. Furthermore, in EC design, they become intelligent energy savers for an extremely wide range of applications.*

## One principle, countless options.

The axial fan, the function of which is similar to a propeller, moves the air axially, parallel to the revolving motor shaft. The ebm-papst external rotor motor is integrated directly into the axial impeller, forming a compact axial fan unit. Moreover, using GreenTech EC motors also enables precision control of the air flow – they are available with tachometer output, analog or PWM input, bus-connectable interfaces and many other features. They are usually installed with wall rings in short or long nozzles.

## AxiTop: the whisper-quiet powerhouse.

The breakthrough for greater efficiency and lower noise: Our AxiTop diffuser provides a significant improvement of efficiency and reduces operating noise at the same time. Its pressure-boosting effect minimises exit losses and makes it easier to adapt the fan to commercially available heat exchangers. The use of the diffuser converts a large part of dynamic speed energy into static pressure.

This dramatically increases efficiency. This makes it possible to rev down and thus reduce the noise by up to 7.2 dB(A) and provides energy savings of up to 27 %. Existing installations can also be retrofitted without redesigning the application. For this, the AxiTop diffuser was awarded the "ASERCOM Energy Efficiency Award".

## All the facts at a glance:

- Compact dimensions
- Available in GreenTech EC technology or AC technology
- Wide selection of models, dimensions and air performance levels
- Optimum efficiency and noise level due to well-engineered aerodynamic design of the fan blades
- High-efficiency, energy-saving designs in GreenTech EC technology with standardised integration of control functions and sensor signals
- Wide range of accessories, including guard grilles, basket guard grilles and wall ring
- The axial fan is dynamically balanced in two planes to DIN ISO 1940
- Numerous approvals, including VDE, UL, CSA, CCC and EAC
- Applications: ventilation, air-conditioning and refrigeration technology, automotive industry, wind power plants and mechanical engineering/finishing equipment industry

## Technical values

Voltage:	85-480 VAC, 50/60 Hz 5-110 VDC
Air volume:	1-65 000 m <sup>3</sup> /h
Power input:	1-12 000 W
Operative range:	up to 350 Pa



## Axial fans.

### The best example: *HyBlade®*.

An outstanding example of the continuous further development and improvement of our products is HyBlade® – a one-of-a-kind material composite developed specifically for large axial fans. HyBlade® brings the benefits of two opposite materials to their least common denominator: maximum efficiency.

For one, a carrier made of aluminium provides high stability. For another, the attached sleeve made of fibreglass-reinforced plastic permits completely free mouldability of the blades. Where metal can be machined only by bending, stamping and punching, fan blades with the HyBlade® structure can be optimised down to the details, for example using winglets on the wing tips, like those that provide greater lift for aeroplanes. For the HyBlade® they enable even higher

aerodynamic efficiency – with minimum weight and revolutionary noise reduction. In conjunction with our highly efficient, groundbreaking motors with GreenTech EC technology, HyBlade® fans become real energy-saving wonders.

No wonder then, that HyBlade® has also become an international sensation. For example, in early 2008, our product innovation received the iF material award (iF International Forum Design GmbH), the renowned prize for outstanding material solutions.

HyBlade® fans are available in many familiar sizes and with standardised interfaces. This makes it particularly easy to switch to our light-weight fans.





**New Benchmark**

Efficiency values that seem to be from another planet: the HyBlade®

## Centrifugal fans.





*Centrifugal fans from ebm-papst are available with forward or backward curved blades. The low-noise centrifugal fans and blowers with forward curved blades are also supplied with a scroll housing. The centrifugal fans with backward curved blades are designed for operating without a scroll housing. For the centrifugal fans with external rotor motors, the motor is positioned in the impeller, which results in an especially compact design in addition to optimal cooling of the motor. The entire product line is available in both AC and GreenTech EC technology.*

#### **Turn down the volume, turn up the power.**

The outstanding feature of our centrifugal fans with forward-curved blades is their minimum noise level and high power density. They are used wherever a large air volume has to be moved in a tight space. To adapt to the aerodynamic and geometric requirements, the impellers are arranged in single-inlet or dual-inlet form. To optimise the efficiency, in addition to the voltage-controlled asynchronous motors, the particularly efficient GreenTech EC motors are used. Thus both drive types are available over the entire power range.

#### **Compact but packed with power.**

The PlugFan series for applications in the medium pressure range is available in the sizes from 250 to 900 mm with a drive output up to 12 kilowatts. All RadiPac fans are equipped with GreenTech EC Motors and, even today, exceed the minimum requirements of the Ecodesign Directive for fans. The designation “RadiPac” is based on the word “packaged”. This means that all functions are already integrated. For example, all fans of this series with an input power greater than 500 watts are equipped as standard with MODBUS and 0-10 V activa-

tion. The mechanical structure in the cube shape is implemented for sizes over 630. The familiar “spider” suspension mount is available up to size 560. In addition, all sizes can also be ordered in a floor-mounted version. Thus the RadiPac fans are suitable not only for use in the air-conditioning and ventilation industry, but also for many other application areas.

#### **All the facts at a glance:**

- AC and EC centrifugal fans with forward-curved blades
- “RadiCal” AC and EC low-pressure fans
- “RadiFit” as EC system solution
- “RadiPac” and “RadiFit” EC medium-pressure fans
- Compact design with external rotor motor technology
- Comprehensive series for every application
- 100% speed-controlled through analogue or serial interface
- High efficiency through use of GreenTech EC technology
- Quiet operation thanks to optimised flow regulation and ingenious commutation of the EC motor
- Easy commissioning with components matched to each other: control/motor/fan
- Extensive range of accessories

#### **Technical values**

Voltage:	85-480 VAC, 50/60 Hz
	12, 24, 48 and 110 VDC
Air volume:	1-30 000 m³/h
Power input:	1-12 000 W
Operative range:	up to 2 000 Pa

## Centrifugal fans.



### The best example: *RadiCal.*

Where HyBlade® is for axial fans, RadiCal is for centrifugal fans: another breakthrough in ventilation and air-conditioning technology. The radical features are both the noise reduction and the additional reduction of energy consumption. As with the HyBlade®, the fan impeller of the RadiCal is made of fibreglass-reinforced plastic. This enables an aerodynamically optimised shape, which cuts the noise level in half and reduces the power requirement significantly.

We have also evolved the GreenTech EC motors or, more specifically, have miniaturised them. This gives the fans significantly more compact dimensions, allowing them to replace existing AC fans without any problems. In conjunction with optimised motor thermal management and increased efficiency, this provides energy savings of up to 50 % compared to AC solutions. Thus the RadiCal not only meets all existing environmental directives with ease, but is also ideally equipped for the future.

RadiCal fans from ebm-papst are available in various sizes and power stages for an extremely wide variety of applications – by request, also as ready-to-install modules.





**The new heat pump champion**  
Unparalleled efficiency and quiet  
performance: the RadiCal



# Fans.

## **Axial, centrifugal or diagonal – all point the way towards the future.**

Fans from ebm-papst, which have long been the standard in electronics cooling, are available in 3 designs:

Our **axial compact fans** are suitable for high air performance with moderate pressure build-up. The flow of air through the fan blades is parallel to the rotation axis. The space-saving integration of the motor makes them extremely flat.

The **centrifugal compact fans** from ebm-papst are the undisputed high-pressure specialists with 90° air deflection and aerodynamically optimised impellers.

For our **diagonal fans** the outflow is diagonal. This compresses the air more – for a higher air flow at high pressure build-up. This makes them particularly well suited for cooling-intensive applications in tightly spaced components.

For each type, ebm-papst offers a large selection of fans, which are available in AC, DC or GreenTech EC design, for all voltages and in all standard sizes. With electronics built-in at the factory, they also offer numerous additional options and can be networked intelligently with the corresponding device logic.

## **All the facts at a glance:**

- Space-saving installation with compact, flat design
- Large selection of sizes and installation depth
- Available in AC or in energy-saving, efficient DC technology
- New ACmaxx generation in GreenTech EC technology and with very high energy savings and longer service life compared to conventional AC fans
- Efficient drives, some of them multi-pole and with 3-phase drives
- State-of-the-art impellers with winglets and sickle-shaped blades for low noise and high efficiency
- High reliability and service life
- Wide variety of monitoring and control functions enable customer-oriented and demand-oriented fan operation
- Various protective mechanisms against ambient influences such as dust, humidity, water and salt
- Safety included: approvals to VDE, UL, CSA, EAC and CCC
- Applications: telecommunications, control cabinet cooling, building ventilation, frequency inverters, solar inverters, medical technology, household appliances, automotive engineering





## Technical values

	<b>Axial compact fan</b>	<b>Diagonal compact fan</b>	<b>Centrifugal compact fan</b>
Voltage:	5-110 VDC, 85-265 VAC	9-80 VDC	9-48 VDC, 115-230 VAC
Air volume:	up to 1 220 m <sup>3</sup> /h	up to 1 100 m <sup>3</sup> /h	up to 1 600 m <sup>3</sup> /h
Power input:	0.1-170 W	10-400 W	2-190 W
Operative ranges:	up to 1 300 Pa	up to 1 400 Pa	up to 1 500 Pa

# Fans.



**Quiet and powerful**



## The best example: *6300 N (S-Panther).*

Compact devices and machinery increasingly require special fans to dissipate waste heat from the applications, which are often densely packed with components. That is why we have developed a new generation of high-performance fan series that responds best to this challenge. The 6300 N is the second in the S-Panther fan series, following on from the 3250 J.

Measuring 172 mm x 51 mm, the 6300 N (S-Panther) boasts significantly greater performance at a number of operating points and is much quieter than its predecessor, the 6300 (S-Force), thanks to a new impeller with state-of-the-art winglets and turbulator, as well as a new strut design.

At free air delivery, the air flow of is between 540 m<sup>3</sup>/h and 1 030 m<sup>3</sup>/h. Thanks to its high air flows and low noise level, up to 6 dB(A) quieter in comparison to the previous model, the 6300 N (S-Panther) can be used in both high-performance and noise-sensitive applications.

That makes the fan series particularly well suited for applications with high endurance loads, such as for frequency inverters and switch cabinet cooling, printing machinery and heat exchangers. However, the fans can also cope ideally with the more varied cooling air requirements in IT and telecommunications or operation in inverters for wind power plants.



# Motors and drive systems.



## AC motors:

As capacitor motors in two- or four-pole design or as asymmetric two-pole shaded-pole motors for low-torque applications, our AC motors offer proven technology for an extremely wide variety of applications.

## DC motors:

The mechanically commutated direct current motors in internal rotor design offer not only high cost-effectiveness, but also reliable technology, good motor dynamics and a wide speed range. Supplemented by the gear product range, complete solutions can be realised for almost all drive tasks.

## EC motors:

Our electronically commutated motors are available in various series and performance classes as internal and external rotor motors. They also feature outstanding high efficiency, long service life and low energy consumption. Additional advantages include: high motor output from a compact installation space, good control characteristics in a wide speed range and high torque stability with virtually silent running. Their outstanding dynamic characteristics allow our EC internal rotor motors to be also used as servomotors. With integrated or external operating electronics, they can be configured as anything from a simple, speed-controlled motor to a communications-enabled CANopen drive system.

## All the facts at a glance:

- Comprehensive motor range for almost all drive applications:
  - AC or direct current motors
  - Internal or external rotor motors
  - Mechanically or electronically commutated
  - EC motor with integrated or external operating electronics
- System solutions including gearbox, brake and speed sensors
- Communications-enabled drives with bus interface
- Customer-specific motor solutions, motor part sets and drive subassemblies
- Power steering drives, drives for clutch actuators and various pumps in the area of gearbox lubrication and exhaust gas treatment

## Technical values

Voltage:	115-400 VAC, 12-60 VDC
Torque:	up to 70 Nm
Power output:	up to 1 500 W
Speed:	up to 30 000 rpm



## The best example: *ECI 63.*

Whether for packing and sorting machines, in the textile industry or medical technology, custom drive solutions are required everywhere – while also providing the lowest possible development and maintenance costs and fast availability. Our solution: the modular ECI 63 drive series, a one-of-a-kind modular system that enables you to put together a custom drive that suits your needs perfectly – including the motor, gearbox and brake as well as the rotary encoder and electronics. Select what you need, and we will assemble and deliver it in almost no time. As your requirements grow, the motor simply grows along with them, as the shaft in open design brought out on the rear makes installing additional modules no problem.

The connection system is also thought through to the smallest detail: intermediate bottoms designed with load-bearing capacity provide a seamless connection, where the modules are joined together mechanically. An ingenious system allows the winding connections to be simply through-connected to the electronics located behind them. The modules fit together perfectly and the dimensions remain compact. To this are added the advantages of the intelligent and groundbreaking GreenTech EC technology. Thanks to standardisation, this comes with an excellent price-performance ratio.



**More system than ever,  
more possibilities than ever**  
Smart modular system:  
the ECI 63 modular drive

# Tangential blowers.



*Oven cooling, thermal storage heaters, wood-burning stoves, floor convectors, air curtains, climate control systems and heating units: All these applications share the need for ventilation with a low overall height and high steady air flow. The ideal solution: Tangential blowers from ebm-papst. They feature exceptionally high air flow and very good noise characteristics.*

## **Stable output for every need.**

Depending on the specific application, tangential blowers are available with asymmetrical shaded-pole motor, capacitor motor or GreenTech EC motor with integrated commutation electronics (including tach output and PWM or analogue output). For the GreenTech EC motors, a higher speed can be selected than for shaded-pole and capacitor motors, for example to overcome higher counterpressure. Using corresponding sensor technology, the tangential blower with GreenTech EC technology can automatically be configured to the necessary operating point and thus provides the exact air volume needed.

## **All the facts at a glance:**

- Low noise at high air flow and low back pressure
- High air flow at low flow rates
- Good contact of cooled ducts and surfaces with cold air due to the expanded width of the exhaust surface
- Very flat design
- Moisture-protected versions, for example for refrigeration technology
- GreenTech EC motors enable higher speed than AC motors
- Performance adaptation via PWM signal or 0-10 V analogue voltage

## **Technical values**

Voltage:	100-400 VAC, 24 VDC
Air volume:	18-1 400 m <sup>3</sup> /h
Power input:	5-80 W
Operative range:	8-60 Pa

The best example:  
*Tangential blowers with  
GreenTech EC motor BG 43.*

In large tangential blowers – such as those used for floor convectors or air curtains – our motor BG 43 with groundbreaking GreenTech EC technology is used. The motor features outstandingly high efficiency and virtually silent operation. In addition, operating electronics that are tuned exactly to the motor offer individual and precision control options.



# System solutions for heating technology.



*Compact design, low air flow, particularly high counterpressure – ebm-papst radial blowers for heating engineering optimally fulfil all requirements of gas condensing boilers, gas water heaters, gas and oil burners, fuel cells and other applications. You will always find the right blower in our extensive product range – whether for gas-fired units with the smallest output or large heating boiler outputs.*

## **The optimum mix.**

For an optimal burning process in condensing boilers, maintaining an exact mixing ratio of gas to air is critical for low NO<sub>x</sub> emissions. Radial blowers with GreenTech EC technology are the ideal solution, as they combine very good control characteristics with smooth running and high efficiency.

A keyword related to energy savings is modulation, the smooth control between the lowest and maximum possible heat output. Modulating operation of the condensing gas boilers ensures particularly economical utilization of the fuel; that is why the blowers are equipped with an interface to the speed output and control system. Controlling the speed is not enough to achieve a modulation degree of 1:10. Additional components, such as a gas valve, burner controller, venturi and mass flow sensor have to be matched perfectly with each other in the group. We made this requirement our challenge.

That is why our radial blowers are available as complete systems including gas valve, burner controller, venturi and/or mass flow sensor. As always, this is the concrete promise we make: The end result is not just a specific system; rather, it is a solution with a systematic improvement in efficiency.

## **All the facts at a glance:**

- Ideal for high pressure in condensing boiler technology
- Smallest installation space at high counterpressure
- GreenTech EC motors with PWM control input, BUS control input and tach output
- Easy installation of customer connections
- Large product selection – for gas-fired units with the smallest output up to large heating boiler outputs
- Smooth running
- High modulation degree
- Optimally matched components

## **Technical values**

Voltage:	100-480 VAC, 24 VDC
Air volume:	50-4 300 m <sup>3</sup> /h
Power input:	20-6 000 W
Pressure increase:	up to 6 200 Pa
Heat output:	0.5-2 000 kW

## The best example: *NRV 77 with venturi.*

This system, consisting of a blower, gas valve and venturi, is intended for use in condensing boilers. It is based on the newly developed NRG 77 premix blower.

The components for the gas-air mixture are matched to each other perfectly in this unit. The optimized combustion allows for high-efficiency heat output of the fuel. Another positive effect is the decrease in the portion of toxic nitrogen oxides in the exhaust. Reducing pollution was not the only goal when developing the NRV 77; minimising noise emission was also a priority.

A high-efficiency EC GreenTech motor ensures smooth running. Undesirable internal vibrations are reduced, thereby minimising the transmission of mechanical vibrations, which proves to be particularly problematic for heating systems. An optional integrated mass flow sensor in conjunction with a venturi nozzle and "GasBloc" pneumatic gas valve maintains a constant fuel/air mixture, regardless of atmospheric pressure or chimney length. Maximum efficiency and environmental performance.





## Hot-air blowers.



*Whether in kitchen stoves, ovens, climate-controlled cabinets, food and plate warmers or in medical devices, sterilisation units and drying ovens: ebm-papst hot-air blowers provide perfect results in both household and commercial applications. They render extremely quiet and reliable service.*

### **Reliability in AC technology.**

We rely on tried-and-tested shaded-pole motors for our hot-air blowers for ovens in domestic environments. In these cases, the hot air impeller is made of either stainless steel, hot-dip aluminized steel or die-cast aluminum, sometimes with a catalytic coating. Especially convenient: Thanks to a special bearing bracket, the motor is installed outside the baking chamber to protect it from heat.

### **All the facts at a glance:**

- Ready to install
- Impellers made from stainless steel, hot-dip aluminized steel or die-cast aluminum
- Temperatures of 120 °C to 500 °C for short periods (pyrolytic self-cleaning)
- Long service life

### **Technical values**

Voltage:	115-400 VAC
Air volume:	100-200 m³/h
Power input:	30-45 W
Operative range:	up to 450 Pa

The best example:  
*RRM 42 for pyrolytic ovens.*

Pyrolytic ovens are a real benefit to cleanliness. Though they relieve homemakers of messy work, the hot-air blower does not get any relief at all. It must withstand temperatures up to 500°C over a period of 1-2 hours without any decrease in output or function. Our RRM 42 hot-air blower has been developed for exactly this challenge, which it passes with flying colours – thanks to specially selected high-temperature lubricants, a high insulation class and a corresponding design which permits optimal heat dissipation from the motor.



# Pumps.



*For climate control systems, beverage tapping units, condensing clothes driers and industrial applications, ebm-papst develops specifically designed pumps: submersible circulation pumps for supplying low-viscosity media such as water, condensate, soap-and-water mixtures or for circulating cooling agents in beverage tapping units and dosing pumps for dispensing liquid detergent, fabric softener, oils, paint, chemicals, etc.*

## All-round specialists.

Pumps come into contact with an extremely wide variety of media. The requirements they have to meet are just as diverse. Particularly in this area, in addition to tried-and-tested standard solutions, entirely new product developments are required. ebm-papst has both the experience and the expertise to help you find the perfect solution to even the most advanced problems.

## All the facts at a glance:

- Large pump selection for specially defined applications
- Operation with asymmetric shaded-pole motor, also available with sprayed motor coil and RAST 5 connection
- Wide motor range including asymmetric shaded-pole motors, single-phase AC external rotor motors and GreenTech EC motors

## Technical values

Voltage:	115-230 VAC
Air flow:	1-12 l/min 60 ml/min for dosing pumps
Power input:	18-125 W

## The best example: *Condensate pump P 11.*

We have designed the condensate pump P 11 specially for a renowned white goods manufacturer. Where it is used: a newly designed heat pump dryer, which uses some 50 % less energy than conventional dryers thanks to its innovative energy recovery concept. A sophisticated sealing concept guarantees that the condensate is only discharged into the waste water and not into the ambient air.

A built-in level monitor reliably prevents any disasters. The tried-and-tested shaded-pole motor technology guarantees sufficient start-up torque from every rotor position, long service life and low manufacturing costs. Thus we have found the ideal solution for this application as well.



# ebm-papst in Germany.

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