

Reimann overcomes the odds!

How Frank Reimann came to terms
with short deadlines and new
standards when installing the
air conditioning system at
Zalando's new logistics center

PAGE 10







9 ebm-papst can look back on an extremely successful business year. Which is good news. What makes us even happier is the confidence shown by our customers, without whom this success would not have been possible — and for which I would like to say a big thank you! Close cooperation is the only way to develop the right solutions from which we can all benefit. And to make sure that is the way it stays in the future, we as a company are constantly seeking to get even better. Stefan Brandl, Chairman of the Board of Directors, will be explaining the ideas we are currently working on.

26 Digitization is a central topic and already very much a focus of our activities. Although we are mainly concentrating on aspects of refrigeration and ventilation in this issue, the networking concept is becoming an ever more prominent feature. As can be seen from the retrofit project for the Swiss Canton of Zug.

24 ebm-papst turns its hand to music! In Augsburg one of our blowers now plays the panpipes. And a fanfare from them would not be out of place at this point: Because the mag won the title of best Industrial Customer Magazine 2017 at the Best-of-Content Marketing Awards. We are very proud of this significant communication prize. It gives us the impetus to carry on writing exciting articles for you — not least in this issue, we hope!



Thomas Borst

—
MANAGING DIRECTOR
SALES AND MARKETING
EBM-PAPST GROUP

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A Mercedes-AMG Petronas Formula One car is shown in a garage setting. The car is silver with teal and black accents. The front wing and front tire are prominent in the foreground. The rear wing and rear tire are visible in the background. A text overlay is positioned in the upper right quadrant of the image.

It's an indispensable team member at every Formula One™ race: the mobile fan **EC AURA**. When the cars return to the garage from the track, the engine, the drivetrain and the brakes are an enormous heat source in an often tight space. For the mechanics at Mercedes-AMG Petronas Motorsport this easily transportable cooling solution is a breath of fresh air. *For the complete story go to mag.ebmpapst.com/ecaura*



Visitors to mountain village Kosh-Agach in the Altai Republic, part of southwestern Siberia, will be greeted with a unique panorama. Part of the view encompasses a nearby solar park with an area of 12,000 square meters. Before its operator can feed the power into the grid, inverters housed in white containers must convert the voltage. They need to operate reliably on hot days in the steppes, so air conditioners from Russian company **EUROVENT** cool them. Three efficient RadiPac centrifugal fans from ebm-papst circulate air in each air conditioning system.





Concrete success

In this customer magazine we normally refrain from reporting about awards. But when the magazine itself wins a prize, there is every reason to show it off. The *mag* won the “gold medal” at the Best-of-Content Marketing Awards — Europe’s most prestigious prize in

this field — and received a trophy in the shape of this block weighing four kilos. The jury was particularly impressed by the lavishly presented, customer-related user stories. The block is made of concrete, not gold, but carries a lot of weight nevertheless. ●

“We will be consolidating our strengths still further”

Stefan Brandl, Chairman of the Board of Directors of the ebm-papst Group, can look back on a successful business year. With a whole range of investments in innovative ideas he is however already setting the course for the future. And that includes the new “one ebm-papst” corporate strategy.

Mr Brandl, let's start by looking back at the 2016/17 business year. How would you sum it up?

The sales figures make extremely positive reading! 1.9 billion euros represents a record result for our company. Compared to the previous year we achieved a growth rate of 13 per cent. Even leaving out our acquisition of the electronics specialist IKOR we are still well above the market average. Such success would not have been possible without the confidence shown by our customers.

How are you planning to maintain this momentum?

By continuing to get even better. The new distribution center that we opened in May in Hollenbach for instance represents a major improvement for our customers. Here, the latest technology and an area of 38,000 square meters enable us to ship our products around the world more quickly (page 34). With further building projects at our sites in Lauf, Muldingen, St. Georgen and Herbolzheim we are reacting to changes in customer requirements. On top of that we are also exploring new ways of developing a greater capacity for innovation. Our sense is that the topic digitization is gaining enormously in significance for our customers. Which is why, following on from the site in Osnabrück, we are opening



With the new “one ebm-papst” corporate strategy, Stefan Brandl is focusing on benefits for customers.

a second start-up offshoot ebm-papst neo in Dortmund to research into new solutions for connectivity and the like.

In the spring you urged your workforce to commit themselves to the “one ebm-papst” corporate strategy. How does that relate to these developments?

The guiding principle behind “one ebm-papst” is to consolidate our strengths still further.

With a clear objective: To become an even better partner for our customers. We are currently involved in a lot of projects, all ultimately aimed at accelerating our operations and enhancing efficiency. The concrete expression of that will be a shorter time-to-market. We discover such potential areas for improvement by talking to our customers. And that helps us to remain the ebm-papst they have come to appreciate. Just that we are even better. ●

A cool solution to an air conditioning challenge



Frank Reimann, Managing Director of MultiCross, and Christof Krause, Building Services Manager at Zalando, inside Zalando's packaging and logistics center in Lahr in the Black Forest.

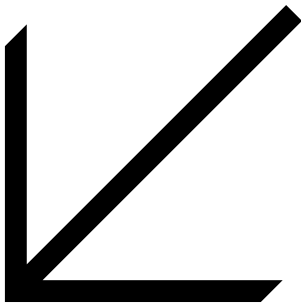
COMPANY
Zalando SE

LOCATION
Lahr, Germany

Europe's leading online fashion platform Zalando has opened a 130,000 square meter logistics center in Lahr. MultiCross was responsible for the air conditioning. As if the technical challenge was not enough in itself, there was also a new EU efficiency directive to contend with — with specifications that were anything but clear.







Christof Krause takes a satisfied look at the air conditioning solution. The company makes exacting demands for its working environment.

Spring 2017, Lahr

Men and women move through the aisles pushing little trolleys. To the left and right there are shoe boxes and packs of hats, tee shirts, leather jackets, sports socks and brassieres. Every now and again they look at the monitor on their scanners, remove items from the shelves and take them to a conveyor system that transfers them to the packaging and shipping stations. Christof Krause lets an employee get past with his trolley and then takes a deep breath. "The air is good here. As we are able to program the amount of outside air in the building, we are in the process of experimenting with it: How much outside air do we want to have, and how much is appropriate from the point of view of efficiency? We don't just rely on measured values, we follow our own noses as well." Krause is Building Services Manager for a newly erected, 130,000 square meter logistics center belonging to the online fashion platform Zalando. The mega-warehouse is located in Lahr in the Black Forest, close to the Rhine and the border with France.

End of 2015, Emmerich

530 kilometers downstream where the Rhine forms the border with the Netherlands, Frank Reimann, Managing Director of the MultiCross air conditioning company, pores over the construction plans for the Zalando logistics center. It is Reimann's job to make sure the temperature remains a constant 22 degrees Celsius at all times

in every last corner of the new logistics center. "Zalando demands very high standards for the working environment and base their planning on extremely tight tolerances. When they say 22 degrees in summer and winter, absolutely everywhere, that is exactly what they mean." An enormous challenge in the so-called order picking warehouse, for example, where the employees retrieve the items from the shelves: This warehouse consists of 175 rows on five levels that will be tightly packed with boxes of clothes in the future. "Air routing in this part of the building is particularly complex. And then there is the sheer volume to consider. We have to circulate around a million cubic meters of air per hour." The logistics center is supposed to be more or less finished in just under a year. The total planned construction time is only around eight months; at the moment the site is a muddy field. At this point in time, Reimann's main area of concern is the imminent introduction of the European Union's 2016 ErP Directive. This increases the efficiency requirements for room air conditioning with effect from 1 January 2016. "The problem with such directives is that negotiations go on almost right up to the last minute. And lots of important details are still not clarified by the time they come into force. Experience shows that the questions really start once the directive is actually implemented." Reimann feels as if he is stabbing around in the dark: How is he supposed to supply Zalando with an air conditioning system complying to a standard that he does not yet know for this fast-moving large-scale project?





MultiCross performing maintenance on the heat recovery systems. Above the administration block, the latest generation of RadiPac EC centrifugal fans ensures constant air exchange — and provides the appropriate interfaces for data polling.



Spring 2017, Lahr

Christof Krause proudly studies the so-called sorter, that automatically pre-sorts the packs of clothes for mailing according to their destination. The logistics center primarily serves Southern Germany, Switzerland and France and will supply to customers on 15 European markets in the future. “We place the pre-sorted containers in the yard and the DHL delivery trucks come and pick them up at night.” Operations are not yet running to full capacity. Six months after the start of the trial period, the logistics center is still being filled up, the mechanics are still working on some of the conveyor systems and 450 people currently come into work every day — over the medium term there will be more than 1,000. “To illustrate the dimensions we are talking about: In the end we will have several million articles here, from babywear to boots. The range is changing all the time. We are reckoning with tens of thousands of outgoing packages per day”

Zalando has only existed since 2008. The start-up company soon overtook the old established businesses and is now Europe’s leading online fashion platform with a turnover of around 3.6 billion euros in 2016. The logistics center near Lahr in the Black Forest is the fourth to be operated by the company in Germany. The site used to be a Canadian air force NATO base. Since it was declared building land a few years ago, one logistics center has sprung up after another. “There is a lot of competition for good workers in the region. So we have to offer an attractive package. As well as being financially interesting, the working conditions have to be excellent as well. And that is why we consider a constant pleasant temperature to be so important.” The company also tries to recruit workers from across the French border: Everything here is bilingual and every employee is given free instruction in the other language.



End of 2015, Emmerich

While Frank Reimann is still scratching his head over the vague 2016 ErP Directive, it occurs to him that MultiCross is a premium partner of ebm-papst. Premium partners are supplied with components and replacement parts more quickly and receive particularly intensive support for their projects. He can now make good use of this help, as ebm-papst was involved in the work on the various ErP Directives right from the start. This time as well. "The limit values were already specified but the concrete criteria to be applied were simply not clear." Is it permissible, for instance, to offset the high efficiency of an EC fan against the low efficiency of a particular filter for the overall system to comply with the standard? The wording was such that it was not even clear whether ErP 2016 was applicable to logistics warehouses like Zalando's at all. "ebm-papst always gave me extremely sound appraisals, so that we had a reliable basis for planning the Zalando project."

Fall 2016, Lahr

Frank Reimann is on site in the Black Forest. One crane lifts 25 heat recovery systems, each the size of a double garage, onto the 17 meter high roof of the building. Then there are the 84 gas engines for driving the installations. The heat recovery systems above the so-called administration block with offices, kitchen, canteen and changing rooms, are fitted with particularly quiet-running and economical RadiPac EC fans. Following the basic installation work Frank Reimann watches over commissioning of the electrical system, the sensors and the data systems. "Together with Siemens we developed the EcoSmart software. This provides our customers with a constant display of the crucial values such as temperature and CO₂ concentration and allows them to be controlled from a central computer." The data are stored in a secure cloud. In the event of anomalies, the MultiTrend Viewer digital assistant developed in conjunction with ebm-papst sends



Frank Reimann enjoys the pleasant atmosphere in the Zalando canteen.

FIND MORE INFORMATION AT:
mag.ebmpapst.com/zalando



a warning email to the applicable technician, or MultiCross can take action in the form of remote maintenance. “With the trend toward smart building services and Industry 4.0, more and more customers expect this sort of system as standard. So it is a great help that the EC fans can simply be actuated via MODBUS-RTU for example, and it is no problem to incorporate them into an information system.”

Spring 2017, Lahr

Christof Krause sits in one of the many conference rooms. “For us at Zalando, such software systems are good interim solutions. We are in the process of creating central software for all our logistics centers, containing the data from all building services — not just from the air conditioning system. It is intended to be suitable for all makes of equipment.” Zalando is aiming to make it easier to compare the values from existing large-scale warehouses, such as power consumption in watts per

article stocked. In this way, the company hopes to achieve greater efficiency and obtain useful information for new buildings in the future. And the building services team will then only have to get to know one type of software. “For this project it is a great advantage that the systems from MultiCross can be readily integrated into the software. It is then very easy for us to pick out the items of data we consider to be important. At the same time, remote maintenance will still continue to function. An ideal solution for our purposes.”

Summer 2017, Lahr

The temperature in the Black Forest soars to 36 degrees Celsius. But the drinking water dispensers in the Zalando warehouse do not have to work any harder than usual. While all the customers are ordering sandals and bikinis, the Zalando employees at the logistics center are still comfortable in long pants and solid safety shoes. ●

COMPANY
BlueChimney

LOCATION
Sorø, Denmark

From a Danish roof-top to the rest of the world

As a chimney sweep,
Morten Bjørklund knows
how much the smoke from
neighboring chimneys bothers
his customers. His idea
of an attachment for
chimneys can help settle
neighborhood disputes.

M

Mr. Bjørklund, you're both a chimney sweep and an inventor. How did that happen?

I've been a chimney sweep for 41 years. During that time, I've climbed onto more than 120,000 roofs. But the number alone doesn't really mean that much. I've learned a lot because I'm curious. I've talked with my customers every day, taken a good look at things, and asked a lot of questions, so I know about their worries and problems. There are a lot of low roofs in Denmark. If smoke doesn't go up after escaping from a chimney, that's a real nuisance. And without a decent

draft, it's harder to light the oven. When it finally does catch, it releases soot and smoke — a nuisance for homeowners indoors and for their neighbors. So five years ago, I had the idea of developing a special chimney fan.

And just what is a chimney fan?

BlueChimney is an attachment that can be put on top of any chimney. It uses a fan to suck the smoke out of a wood-burning stove, mixes it with outside air to cool and dilute it, and then expels it forcefully. That keeps the chimney free, smoke and soot emission stays

relatively low, and the neighbors aren't bothered by smoke. BlueChimney also reduces particulate emissions. It's a solution with plenty of demand. Last winter, we sold 1,000 units in Denmark.

What makes your invention so special?

BlueChimney is very user-friendly. It doesn't need much electricity, so anybody can install it alone. And with a remote control, you can adjust it for optimum smoke extraction from your chair. That keeps the fire small and the flame steady, so you can use up to 20 percent

“I talked to my customers every day, took a closer look, and asked a lot of questions.”

MORTEN BJØRKLUND — BLUECHIMNEY



less wood. On top of that, with its small EC motor, the chimney fan doesn't need much energy. One reason is because the motor is also smart and automatically switches itself off when it can.

How did you go about implementing your idea?

When you begin with an invention, there are a lot of things you have no idea about. But that's no problem as long as you can find an expert for each issue. For me that was ebm-papst in Denmark. With all their experience with fans and motors, the people there were able to help me. I met with them regularly. That was what it took to develop a suitable motor together. Working together to find a material that could withstand the high smoke temperatures of up to 700° Celsius was a real challenge. The motor, the fan, its electronics, and the programming are BlueChimney's most important components. This good partnership was a big help in developing the invention, and it's still going on.

Do you work alone otherwise?

No, not anymore. Three and a half years ago, I found the perfect partner: Pauli Joensen. He used to be the managing director of a big company, so he knows the things I can't do, the business aspects. Together we set up our company, BlueChimney. Today we have four employees, and we don't get bored. Unfortunately, I don't go up on roofs anymore. I miss that a lot. But we're working on an exciting new idea now. I can't tell you exactly what it is yet, but you can bet the next year will be exciting.

What's next for BlueChimney?

We'll be starting sales for the next season in Sweden, Norway and Germany. In comparison with Denmark, there are plenty of two-story houses in Germany and also stricter laws regarding fireplace approval, but there's still strong demand for clean air. In the next few years, we'll be concentrating on all of

northern Europe. For about a year, we've had a partnership with a Danish company that makes stoves. Now customers can even get our product in any European home improvement store. Our plan is to sell up to ten thousand chimney fans in Europe in the next four years. Our target group is basically anywhere where it's cold in winter and people use wood or pellets for heating. And I think there's also a market for BlueChimney in North America; I was just there on vacation and took advantage of the opportunity to get a patent for the United States and Canada.

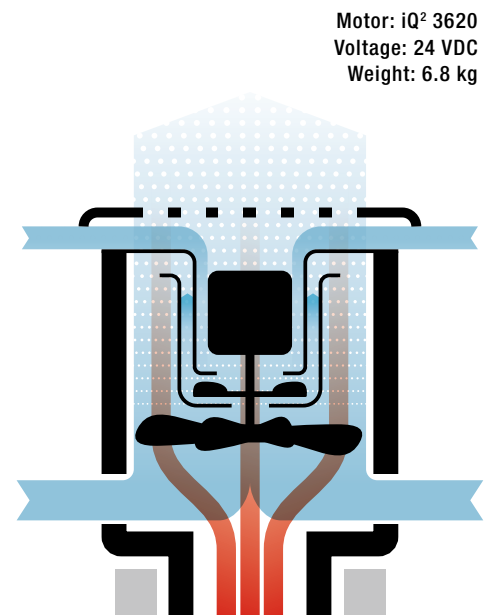
Does BlueChimney help neighbors get along better?

Unfortunately we can't tell from our orders whether the customers are buying the chimney fans for themselves or for their neighbors. But the winner of a contest we held for Christmas gave her BlueChimney to her neighbor. When we heard that, we offered her another one at a special price. Everybody was pleased by that. It would be a nice thing to think about, a "love-thy-neighbor" campaign ... ●

FIND MORE PICTURES FROM DANISH ROOFS AT:
mag.ebmpapst.com/bluechimney

How BlueChimney works

The smoke extractor attachment fits on any chimney. The fan draws in air at the side, and a patented twin cooling system ensures that the motor in the housing largely remains cool. As a result, the BlueChimney unit can withstand high temperatures and has a long service life. The concentration of the smoke is also reduced by a factor of ten to 25 before it is forcefully expelled from the chimney. iQ motors are usually used in refrigeration technology.



COMPANY

Backaskolan Malmö

LOCATION

Malmö, Sweden

QUIET PLEASE!

A loud ventilation system was a headache for the teachers and the pupils at the Backaskolan in Malmö, Sweden. Then came Martin Jörgensen, a technician from Caverion, to quiet things down.

The Backaskolan in Malmö is actually a pretty idyllic place to go to school. The school is situated in Sege Park, offering its 250 pupils a bit of nature in the middle of the Swedish metropolis. But things were anything but idyllic in the classrooms in recent months, with teachers and pupils regularly leaving the building in the afternoon with their heads buzzing.

At fault was not any kind of difficult subject matter, but the loud ventilation system. It had seen better days and was as noisy as any steamship, making teaching almost impossible.

Retrofit with RadiFit

The school administrators were aware of the problem, but were at first unable to find anybody who could solve it. Not knowing how to fix the problem, various service providers rejected the job. Only Martin Jörgensen was able to help. He is a technician with Caverion Sverige AB, and when his facility management coworker contacted him with the request from the school in Malmö, he took a close look at the droning ventilation system. "The fans were out of balance," he recalls. "That made them vibrate, which caused the loud noise." It quickly became clear to Jörgensen that replacing the fans was the only way to quiet things down. So he contacted Jan Sörensen at ebm-papst in Sweden. "As I always do in cases like that, I called Jan. He suggested two possible products, and I decided on the RadiFit centrifugal fans," recalls Jörgensen. "The previous fans were also double inlet fans, and the dimensions were a good fit as well."

No vibrations, no noise

Now two RadiFit fans make sure things stay quiet in the Backaskolan. "Their offset blades reduce noise emissions," says Sörensen. "Their mountings are soundproofed, and the impeller-rotor unit is dynamically balanced. That minimizes structure-borne noise and ensures low vibration levels. With their scroll housings and backward-curved blades, the units also facilitate an ideal pressure increase and high efficiency at high pressures. That keeps the classrooms dependably ventilated.

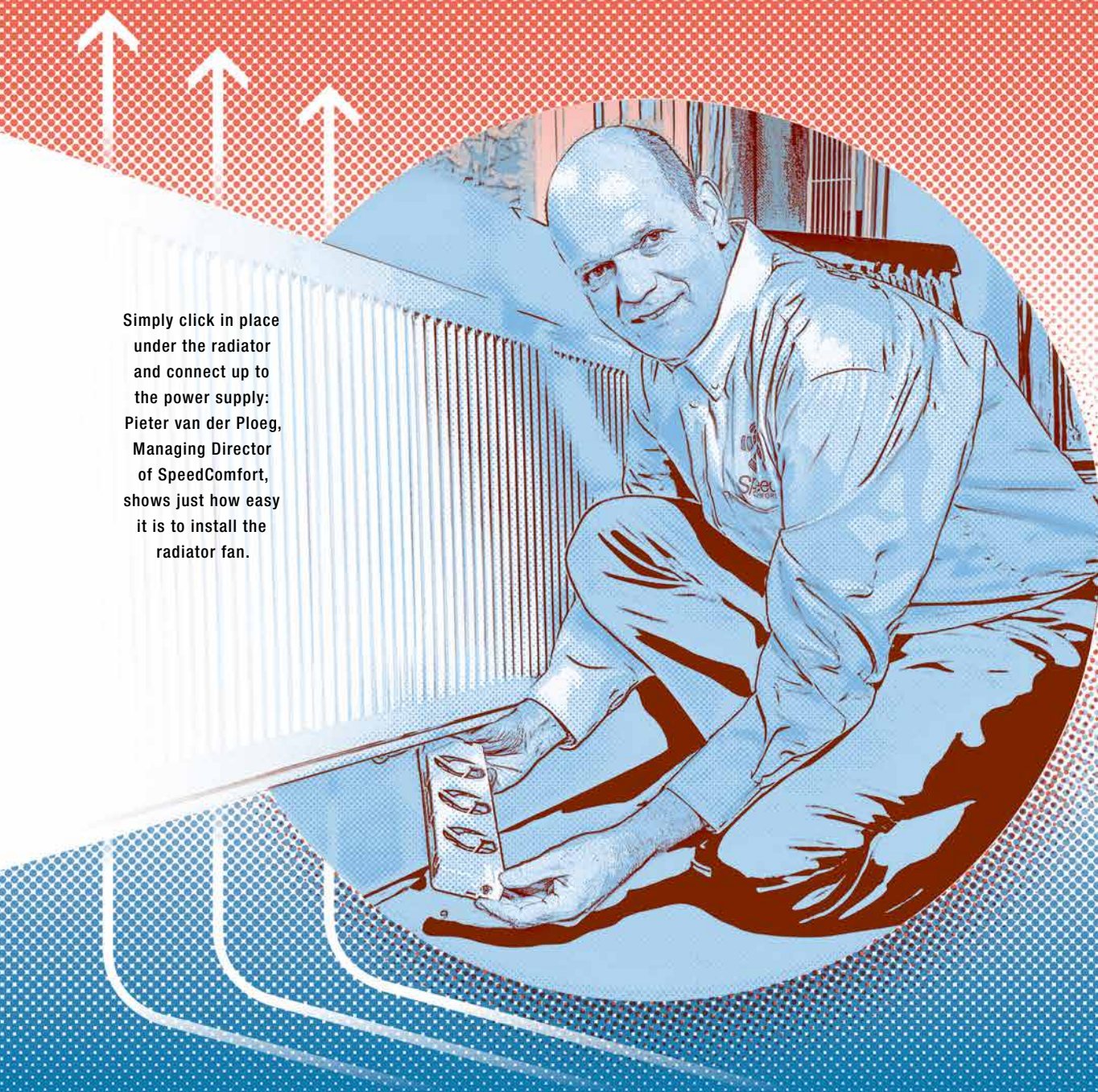
Silence sounds so good

Replacing the fans was child's play for Martin Jörgensen because they can also be mounted without a flange. "One of the fans installed a bit too high for the existing opening, so I just mounted it without a flange and that worked just fine," says the experienced technician. "That's how it's always been with fans from ebm-papst. They're easy to install; I've never had any problems." He was able to start up the new RadiFit fans on the school's roof quickly and easily using their central terminal area for different connections, and without having to make any parameter settings. He is not the only one who is happy with the results. "After we restarted the ventilation system with the new fans, I went to see the teachers in the classroom," recalls Jörgensen and has to laugh. "At first they couldn't believe the system was even running, because you couldn't hear anything anymore." Obviously everybody is relieved and looking forward to days of teaching without headaches — at least not from the ventilation system. ●

Fans helping to change the world

It's small, quiet and unobtrusive — and makes the world a little better. The Speedcomfort radiator fan helps circulate heat from heating systems faster and more uniformly while significantly reducing CO₂ emissions and cutting energy consumption by up to 30 percent.

Simply click in place under the radiator and connect up to the power supply: Pieter van der Ploeg, Managing Director of SpeedComfort, shows just how easy it is to install the radiator fan.



COMPANY

SpeedComfort BV

LOCATION

Den Dolder, Netherlands

A

Anton van den Broek had the idea for the little helpers seven years ago. “Many people in my neighborhood live in old, very poorly insulated houses,” he says. “They don’t have much money, but they have to pay a lot for energy. I wanted to help them lower those costs by reducing their energy consumption.” His idea was a radiator fan comprising three fans and mounted under the radiator to quickly and uniformly distribute the heat. But at first his idea couldn’t be implemented due to a lack of funds.

Over lunch two and a half years ago, he told his coworker Pieter van der Ploeg about his idea. Van der Ploeg is managing director of “GO!”, a company that boosts the energy efficiency of apartment buildings. Van der Ploeg was convinced right away. “I decided to take up the idea and implement it,” he says. He went to work with the engineers Arnold Halbertsma and Henk de Groot and developed the Speedcomfort radiator fan. The three got together every Tuesday afternoon to work on the product.

Environmentally friendly European production

For the heart of the application, the three fans, they immediately chose ebm-papst. The two engineers had worked for a long time in the ventilation sector and knew the fan specialist well. And the start-up wanted environmentally friendly, European production.

The product they chose was a DC axial fan. “To cool a room, you need a lot of air flow. But if you only want to circulate the air better, you don’t want to feel any wind,” explains van der Ploeg. To keep the speed as low as possible, ebm-papst in St. Georgen redesigned the winding. And the team installed the fans for the application, which are normally used for LED cooling, in a rectangular housing instead of a round one.

Everything went very quickly. Van der Ploeg and the two engineers began planning in the spring of 2015. Implementation with ebm-papst began in July, and in November the prototype of the Speedcomfort radiator fan had already won the prize for Holland’s greenest idea. That put the company under pressure. “We began sales in the web shop in December, two months earlier than planned,” says van der Ploeg. “That was tough, but it was also a sign that the market had been waiting for a product like this.” Series production began in January 2016.

Simple installation

A key to the product’s success is certainly its simple installation. Anyone can click it into place under a radiator using four magnets and then plug it in. The device has a built-in temperature sensor and starts running as soon as the radiator reaches a temperature of 35 degrees. Then the three fans assist the flow of warm air and circulate it uniformly throughout the room. It can barely be heard and makes the room more comfortable. The Speedcomfort’s operating cost is only 16 cents per year.

Sustainable in every way

It also reduces the heating system’s flow temperature significantly. Normally the residents have to set the water temperature in their heating systems to 80 degrees to warm up the room slowly, but with the Speedcomfort radiator fan, 60 degrees is enough for a warm and cozy home. That means less oil, gas or coal is needed for heating, and households can use up to 30 percent less energy. And the world benefits from lower CO₂ emissions. If one quarter of the households in the Netherlands would use the Speedcomfort system, the little country on the North Sea could cut CO₂ emissions by a billion kilograms.

“With Speedcomfort, we’ve developed a product that’s sustainable in every way,” says van der Ploeg. The unit consists of materials produced with renewable resources. The manufacturer has also set itself some social goals: Speedcomfort is assembled by people with mental or physical handicaps who would be unable to participate in normal job market.

Coming soon to Germany

Thus far, the radiator fan is only available in three models in Holland and Belgium. Pieter van der Ploeg hopes to be able to sell it in the German market soon; therefore, he is looking for sales partners, who ideally should share the same grand vision: “We want to make the world better, reduce our CO₂ emissions and stop climate change.” ●

WATCH THE VIDEO ABOUT THE SPEEDCOMFORT AT:
mag.ebmpapst.com/speedcomfort

COMPANY

Fritz-Felsenstein-Haus

LOCATION

Augsburg, Germany

Panpipes with a joystick

Students have developed an electronically controlled instrument for therapeutic purposes.

The Fritz-Felsenstein house in Augsburg provides all sorts of help for around 300 physically challenged children and adults. The aim of the inter-disciplinary concept is to enable each individual to lead a self-determined life. Music therapy has an important role to play in this. It helps the participants to express themselves and stimulates learning processes. For a little while now, the sound of a unique instru-

ment has been filling the rooms of the Fritz-Felsenstein house: electronically controlled panpipes that can also be played by the physically challenged. “Peter Pan’s Flute”, as the instrument was christened, was a project developed by students training to be mechatronics engineers at Augsburg University. The part normally played by pursed lips is taken over by a fan from ebm-papst in this case. ●



SHORT FACTS ABOUT THE PROJECT

WATCH THE VIDEO ABOUT PETER PAN'S FLUTE AT:
mag.ebmpapst.com/panfloete



CONTROL

The Fritz-Felsenstein house deals with all sorts of different physical challenges. "Peter Pan's Flute" is accordingly provided with a flexible control system. A joystick, tracking ball or mouse can easily be connected up via USB. Inputs are directly transmitted to the slide and blower to control movement and the flow of air.



MOVEMENT

To simulate "real" flute playing as accurately as possible, the students decided against having a separate valve to actuate each pipe of the instrument.

Instead, the panpipes move along the artificial lips of "Peter Pan's Flute" on a slide. So the person playing the instrument can vary the tone as required



TONE GENERATION

The students considered various ways of producing the tones. Ultimately they came to the conclusion that an authentic result could best be obtained by using a blower. Alongside the pressure required (roughly 30 millibar), the most important selection criterion for the blower was a low noise level. The CPAP centrifugal blower from ebm-papst, originally developed for respiration devices, satisfied both requirements.

COMPANY
Canton of Zug

LOCATION
Zug, Switzerland



Discussions around a recirculation cooler: Daniel Spurgeon from ebm-papst (left), Stefan Haydn from Inframatic (right) and André Lötcher representing the Canton of Zug (bottom).

Always well informed

The more information that is available, the easier it is to keep everything under control. Which is why the people responsible for upgrading the data center of the Canton of Zug decided on efficient fans with MODBUS interface.

It is particularly important to ensure the best possible storage of information relating to the judicial system, the police and the tax authorities. This applies not just to the encryption and storage of the actual data, but also to the hardware on which they are stored. So it comes as no surprise that reliably air conditioned server rooms are a top priority for the Canton of Zug. Modernization of their recirculation coolers was a prime concern of André Lötscher, Technical Manager of the Canton of Zug Structural Engineering Department. “For years the belt-driven fans in our cooling units have been constantly running to full capacity,” explains Lötscher. “The V-belts required regular checking and had to be replaced in the event of excessive wear, and we had to react instantly if they tore.” That is why he urgently wanted to modernize the recirculation coolers and replace the old fans at the same time. Further objectives were better control characteristics and closer monitoring of the system. Lötscher would only consider complete replacement of the units as a last resort: “Our recirculation coolers satisfy exacting requirements in terms of shock resistance for example and cannot simply be replaced by a standard unit. The complete replacement of all units would be pretty expensive and a lot of work.” →



So Lötscher made a few inquiries and finally obtained the number of Inframatic, a small company near Basel specializing amongst other things in building automation and air conditioning systems for all sorts of rooms. Not long afterwards he called Project Manager Stefan Haydn, who came up with a few ideas straight away. He set a date for a visit to Zug, and brought Daniel Spurgeon, Area Sales Manager at ebm-papst, with him.

When the three of them inspected the premises and the cooling units, it became apparent that the best alternative for the Canton's data center would be to replace the belt-driven fans with EC fans — this would not only get rid of the old fans but also reduce current consumption. "In our discussions we also talked about the options available for control and monitoring of the fans," recalls Stefan Haydn. "The minute I heard that the ebm-papst fans can be actuated and monitored via MODBUS-RTU there was no doubt in my mind that this was the course to follow."

Precision control

In the weeks that followed, Inframatic first had five recirculation coolers converted. Thanks to the use of RadiFit fans and EC centrifugal blowers with a high power density, the hardware retrofit took no time at all. "The fans from ebm-papst permitted virtually 1:1 conversion, completely straightforward," says André Lötscher. Installation of the RadiFit fans, that were developed for precisely such cases, was particularly easy.

With regard to control, Inframatic had a few clever ideas on how to make operation even more efficient. As the belt-driven fans only had two speed settings prior to upgrading, the temperature was largely regulated by the opening of the cooling registers. The experts completely reversed this less than ideal energy principle in the converted recirculation coolers. The output is now controlled via two sequences: In the first sequence, the cooling capacity is regulated by the flow control valves and in the second by the fans. This is made possible by the fact that the fans are infinitely adjustable. The speed at which the fans rotate is controlled automatically by temperature sensors that measure the exhaust air. If the air is too warm, the cooling valve is fully opened and the fans rotate from a defined minimum speed up to the maximum speed. If the air is too cold, the fans turn more slowly and the cooling valve is closed. This ensures that the temperature in the server room never exceeds the specified 22 to 23 degrees Celsius.

A further advantage of the fans in the converted recirculation coolers is actuation via MODBUS-RTU. "It absolutely suits our purposes that the fans, along with other components in this application, can be actuated and monitored via MODBUS-RTU," explains Stefan Haydn. "That makes it easier for us to coordinate the interaction of all components." In contrast to a 0–10 V connection, MODBUS-RTU allows not just control, but also monitoring of the fans. They pass detailed data such as voltage and current draw, as well as alarm messages, to the higher-ranking control system for instance. This in turn

transfers the data to the management system, which collects information on all the building services in general. Via the interface with a touch panel the administrative staff of the Canton can thus view individual values and set various parameters.

Simplified maintenance

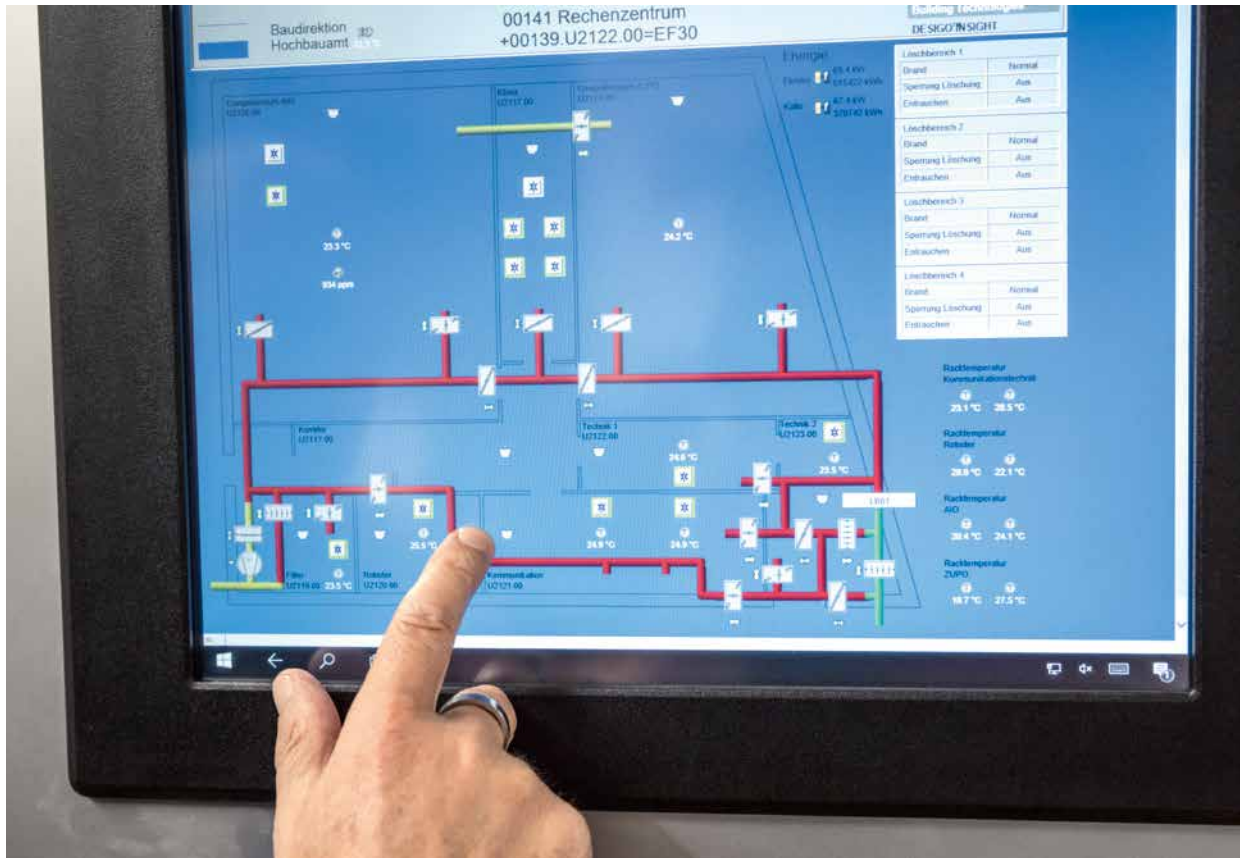
"The more detailed warnings really are a great help," says Haydn. "They make it easier to see whether a problem is just a passing anomaly or a fault requiring a technician to take a closer look in the server room." MODBUS-RTU also made control system adaptation and addressing of the fans more simple for Inframatic. "With our EC Control software, customers can check developments and parameter settings quickly and easily," explains Daniel Spurgeon. "That saves time and is particularly helpful at the outset of a development." To ensure even greater reliability, critical rooms are equipped with two recirculation coolers. These are operated in a master-slave configuration so that all the fans in the units run at the same speed.

Delighted by the simplicity of the process, Lötscher ordered the conversion of more units immediately after modification of the first five recirculation coolers: Once all the systems in the data center had been modernized, work started on the ventilation system of the police firing range and headquarters and in an adjoining prison building. "When you have seen just how well the conversion works and how economically attractive such measures are, you start to realize there are any number of other opportunities," says Lötscher. "What's more, our air conditioning system is now not only more modern, it is also far more energy-efficient." ●

Well informed thanks to MODBUS-RTU

As compared to actuation by way of a 0–10 V signal, the incorporation of fans via MODBUS-RTU offers a whole range of advantages. For instance, a fan can not just be actuated via MODBUS-RTU, it also passes information on its operating status to the control system. This includes power consumption, current speed, the number of operating hours and detailed error messages. In addition, MODBUS-RTU makes it possible to connect multiple fans with a single cable, thus reducing the amount of installation work.

Everything at a glance:
Thanks to MODBUS-RTU, the fans are perfectly integrated into the control system.



“This solution makes it easier for us to coordinate the interaction of all components.”

STEFAN HAYDN — INFRAMATIC PROJECT MANAGEMENT



Stefan Haydn from Inframatic explains the fine workings of the system that controls the fans and the flow control valves.

COMPANY

Aichinger GmbH

LOCATION

Wendelstein, Germany

Roll out the perfect steak

With his “plug & play” Roll ’n’ Grill, the Bavarian restaurant and shopfitting expert Aichinger has really struck a chord.

Mmm, that smells delicious! The aroma of freshly grilled meat fills the room, making the customers’ mouths water. They only have to wait about two minutes for an appetizing brown crust to form around the juicy pink center of the steak. Not that the expectant gourmets can actually see this happen, even though it is taking place more or less right in front of their eyes. And they are not in a steak restaurant either. The steak is being cooked to perfection in a gas station shop.

Oh no, that can’t be any good, exclaims the true meat lover in dismay! But indeed it is: The Roll ’n’ Grill system — or ROG for short — created by the catering expert Aichinger, met with an overwhelmingly positive response from the trade visitors to the EuroShop in Düsseldorf and the Internorga in Hamburg in the spring of this year. “We thought that the product would go down well, but we hadn’t anticipated such immense interest,” explains Sebastian Holzberger, Marketing Manager of Aichinger GmbH. The Sales department in Wendelstein currently has more than 1,000 inquiries to deal with. “And we are not talking about individual orders,” stresses Holzberger. “Alongside bakeries and butcher’s shops, entire burger and supermarket chains are interested in buying our grill, to say nothing of gas stations.”

Hot off the roll

The idea of a roller grill is not entirely new. 20 years ago, the Palux company produced something of this nature, developed by Peter Gutekunst. It was successfully marketed for several years under the name Rotimat before production was discontinued on account of dwindling demand. “It was a good idea but the time was probably just not ripe,” Holzberger presumes. In 2015 the designers at Aichinger GmbH revived the concept and set to work. At the heart of the Roll ’n’ Grill are three rotating, horizontally arranged and evenly heated grilling surfaces made of stainless steel. The food passes over these rotating surfaces and drops onto a grate ready for serving when it is done. The rollers are surrounded by a compact housing with an opening at the top, into which the operator can place meat, or alternatively fish, sea-food, vegetables or frozen burger patties. He can then set the speed on the control panel and collect all the cooked food from the tray at the bottom of the unit after just a few seconds. “Even for people with no experience it’s child’s play and a crucial factor in the success of the ROG, as the catering trade is always on the look-out for equipment that is simple and intuitive to use and does



The roller grill serves up perfectly cooked food — in just 90 seconds.



WATCH THE VIDEO ABOUT THE ROLLER GRILL AT:
mag.ebmpapst.com/roll-n-grill

not require any skilled personnel,” explains Sebastian Holzberger. The compact ROG can produce up to 80 portions an hour and guarantee a consistently high quality standard

No need to rush

The heart and soul of the ROG system are the motor and the transmission that set the rollers in motion. “The original model already had a ZEITLAUF transmission and a motor from ebm-papst. So our first step was obviously to contact these two companies, that now form one organization,” says Holzberger. The experts from ebm-papst soon came to the conclusion that the envisaged shaded-pole motor would not be up to the task. “On account of the installation situation, the smooth operation required and the low drive speed, the only feasible option was a compact spur gear,” explains Hans-Georg Konnerth, Market Manager Industrial Drive Technology at ebm-papst ZEITLAUF. “This makes it possible to implement a very high reduction ratio that permits a speed range of two to three revolutions per minute at the transmission output.” The experts decided on the Flatline 85 spur gear with a reduction ratio of 1028:1. The motor

used is the EC motor BG 4310. “The requirements included different speeds — one for grilling mode and one for cleaning mode,” says Matthias Braun from ebm-papst Sales in Landshut. The line-operated EC motor has excellent control characteristics, is energy-efficient and features the appropriate control electronics. On account of the heat generated in the grill, the electronics is installed separately away from the motor and connected to it by cables. Cooling is additionally provided by two small fans supplied by ebm-papst in St. Georgen.

The motor is produced in Landshut and assembled with the spur gear in Lauf, before being supplied to the customer as a tested gear motor unit together with an electronics box.

Sebastian Holzberger is delighted that the new grill works so fantastically well, and absolutely raves about the taste of the grilled food. That is something Hans-Georg Konnerth and Matthias Braun still have to look forward to, as they have not yet had the chance to enjoy a steak from the ROG. But that can soon change. “We are planning to deliver the first grills in October,” assures Sebastian Holzberger, and then the aroma of grilled food will start to fill the air in all sorts of unexpected locations. ●

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D- 74673 Mulfingen
+ 49 7938 81-0
Info1@de.ebmpapst.com
www.ebmpapst.com

Responsible for content

Thomas Borst

Editor-in-chief

Kai Halter

Project co-ordinator

Katrin Lindner

Editorial staff

pr+co GmbH
www.prco.de

Layout and production

pr+co GmbH,
Steffen Beck, Tanja Haller,
Julian Stutz, Gernot Walter

Art Direction

Gernot Walter

Authors

Steffen Beck
Thomas Borst
Florian Burkhardt
Remo Fedele
Tina Hofmann
Stefan Magerl
Sebastian Stamm
Julia Stolte
Julian Stutz
Monika Unkelbach
Annina Werths

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Raff GmbH



$$p = \frac{\rho v_a^2}{2\varphi^2}$$

The flow rate is the most crucial factor of influence when producing die-castings.

In die-casting, the molten metal is pressed into a mold at high velocity and under great pressure. The velocity of the molten metal in the gate v_g is usually between 30 and 60 m/s. Casting pressures attain values of between 400 and 800 bar. A high mold filling rate and high pressures make it possible to produce castings with high dimensional accuracy and extremely good surface properties. The specific casting pressure occurs in the cavity of the permanent mold. The higher this is, the higher will be the gate velocity.

When calculating the casting pressure it is however important to make allowance for the fact that flow resistances that have to be overcome occur at changes in cross-section and direction, at corners, at edges and on account of wall roughness. These resistances are calculated using a dimensionless quantity, the resistance coefficient φ . According to the Bernoulli equation $p = (\rho v_a^2) / (2\varphi^2)$, a relationship exists between the metal pressure and the gate velocity or flow rate.

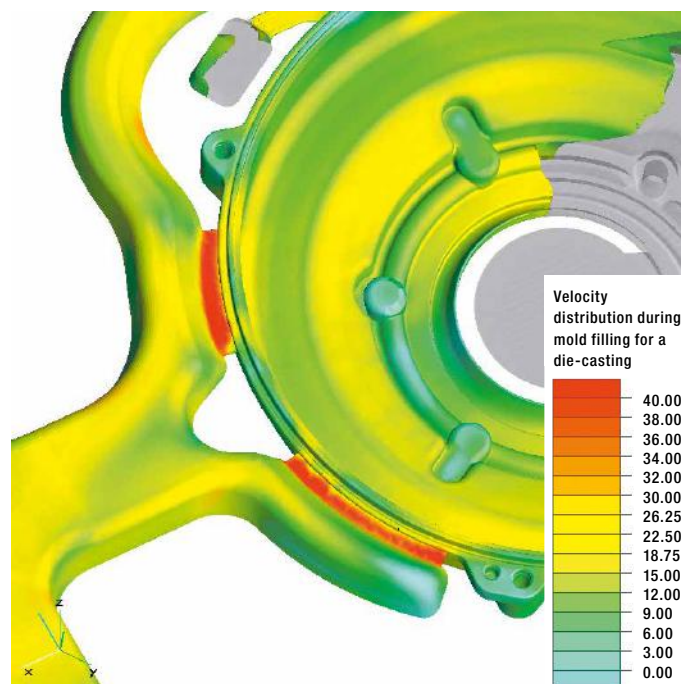
At low velocity there is a risk of solidification in the gate before the secondary compression of the liquid metal takes effect in the mold cavity. It also results in irregularities in the stream structure, such as slag or oxide particles, and in local clogging. Low flow rates do however cause less turbulence and are favorable with respect to gas removal from the mold cavity.

The local wear and cavitation associated with higher flow rates shorten the service life of the casting mold. These do however normally produce castings with smooth surfaces and a fine-grained structure.

Depending on the casting material and the casting concerned it is therefore important to choose an appropriate specific pressure to obtain a casting of optimum quality. Casting simulation can be helpful here. This numerical simulation is primarily a mathematical description of the Bernoulli equation. It provides a graphical representation of the relationships between pressure and flow rate as a function of the optimum casting temperature for the various alloys. With the results obtained, components and tools can be optimally designed. ●



REPRESENTATION OF FLOW RATE





A landmark for Hohenlohe

The new distribution center ensures punctual deliveries worldwide — and lots more besides.

With a height of 35 meters, the high-bay warehouse towers above the landscape — and symbolizes a veritable ebm-papst landmark project: the new distribution center in Mulfingen-Hollenbach. Right next to the plant 4 manufacturing facilities, a building complex covering a total of 38,000 square meters has grown up on the Hollenbach hillside in just 15 months.

Logistics hub

“The dramatic rise in our sales figures in recent years has led to a considerable increase in our logistics activities,” explains Thomas Wagner, Managing Director of Production and Materials Management of the ebm-papst Group and responsible for the project. Which is why, in 2015, the company started to make concrete plans to concentrate its logistics operations in one location. “Within the Group we often supply to the same customers from several different production locations,” says Wagner. The consignments from the various plants are now handled in a cross-docking process, in other words virtually without storage, and supplied to around 1,000 customers throughout the world. “Hollenbach is an ideal site, as some 40 per cent of the goods come from plant 4.” The concentration of all the packaging, shipping and warehousing facilities at this central location cuts out the

need to travel to the other plants and so saves the company a transportation distance of more than 500,000 kilometers per year. “Our customers expect full service around the clock. This means fast delivery without any delays, perfect packaging and safe transportation,” stresses Wagner. All this is guaranteed by ultra-modern technology in the distribution center: The average time required to move a truck-load of goods from the shelves to the ramp is just 60 minutes.

Commitment to sustainability

But planning and construction did not just focus on the customers. In keeping with the GreenTech corporate philosophy, particular emphasis was also placed on energy-efficient solutions. The distribution center undercuts the legal requirements for the energy efficiency of new buildings by more than 80 per cent. In recognition of this, the German Sustainable Building Council pre-certified the center with its platinum award — the top label. The employees were also asked in advance about ideas for potential improvements with the aim of creating the best possible working environment for them. Leaving all that aside, an investment of more than 40 million euros is in itself a strong symbol of commitment to the region — and to around 3,500 jobs. ●

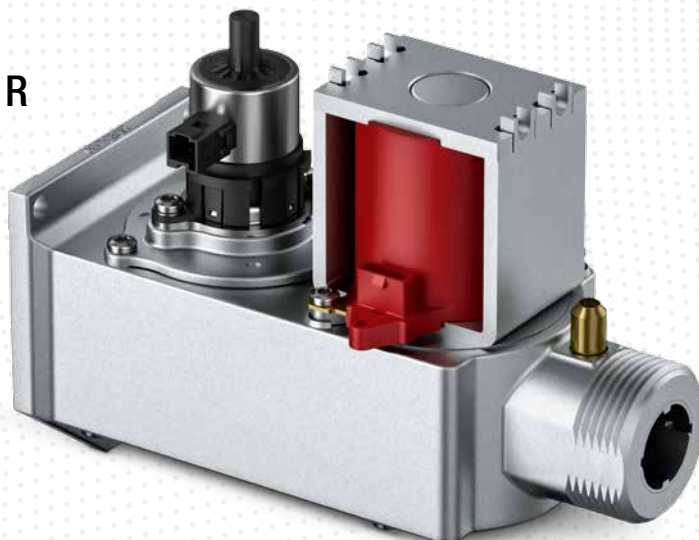
The new distribution center offers customers round-the-clock service — and represents a commitment to 3,500 jobs in the region.





TOP FOR GAS AND AIR

The new gas valve G32 F01 is an addition to the portfolio for heat outputs up to 150 kW. The electronic gas-air composite system with a modulation ratio of 1 : 10 is intended for pre-mix and blower-assisted burners. The twin coaxial valve guarantees reliable operation.



SUPERIOR FAN

The 8300 N tubeaxial fan is suitable for the cooling of compact, highly integrated electronics in IT, telecommunications and network systems. The DC axial fan, measuring just 80 x 80 millimeters, outstrips its predecessor in every respect: Eight db(A) quieter, 112 % more efficient at the optimum operating point, only half the amount of energy and a pressure increase of 280 pascal — with an air flow of up to 130 m³/h.

www.ebmpapst.com/8300n



SMART DESIGN

The impeller, GreenTech EC motor, control electronics and scroll housing of the RadiCal centrifugal fan for home ventilation are all perfectly matched. It is thus both extremely powerful and quiet-running, as well as being easy to install thanks to plug & play. A vane anemometer measures the air flow, and integrated sensors provide optional monitoring of temperature and humidity. The MODBUS-RTU interface permits both remote monitoring and programming.

www.ebmpapst.com/radical4home





Efficiency close to home

A local heating network is substantially more efficient than district heating. But to date there has been a lack of space-saving solutions for gas-condensing boilers. The new pre-mix blower from ebm-papst will change all that.

With a natural gas supply, energy can be conveyed without any losses even over long distances. What's more, a single gas pipe can transport more energy than a complex district heating piping system with insulated supply and return pipes. The infrastructure is thus less complicated, and building projects can be implemented more quickly even in conurbations.

01

A high-efficiency boiler with an output of two megawatts can supply up to 50 stories or a residential area with 100 individual houses.

02

In the past, multiple condensing boilers had to be combined to produce such an output. Now a single boiler is sufficient.

That cuts the costs of installation, operation and maintenance.

03

THE G3G 315 IN OPERATION AT LOCHINVAR

Lochinvar, the US market leader for high-efficiency boilers, uses the high-performance blower in its Power-Fin range. The first project for the high-performance high-efficiency boiler was a building complex in Las Vegas with 300,000 square meters of floor space.

READ THE WHOLE STORY AT:

mag.ebmpapst.com/lochinvar

“More power for local heating”

How the new G3G 315 pre-mix blower helps to create an efficient local heating supply is explained by

Christian Diegritz,
Head of Product
Management,
Marketing and
Communication
at ebm-papst.



What is the advantage of the new pre-mix blower?

Up until now there has not been a suitable high-efficiency, modulating gas blower on the market for single boilers with a heat output of more than one megawatt. Multiple boilers had to be operated in cascade arrangement to achieve higher outputs. The G3G 315 pre-mix blower is designed for a heat output of up to two megawatts. That is the level of heat output required to provide 50-story apartment blocks or roughly 100 individual houses with heating and hot water, for example. And that can now be achieved with one boiler. Which means that not only is less space required, it also cuts maintenance costs.

Where are such gas-condensing boilers used?

There is a distinct trend toward ecological gas heating systems situated on the spot for local supply. In the light of rising energy prices and stringent environmental standards for new buildings, a district heating supply is not always an ideal solution. Even if the pipes are well insulated, the heat losses during transportation of the heating water and the material expenditure for laying pipes over long distances are simply too high. Decentralized heating solutions with natural gas pipes make it possible to reduce this outlay. On top of that, natural gas pipes are virtually maintenance-free. A local heating supply is thus far more efficient for large buildings like apartment blocks, as well as for residential areas.

How did ebm-papst enhance the performance of the blower?

Development was based on an existing motor platform that we then adapted to the special requirements of the heating sector. For instance, we managed to obtain an optimum balance between the aerodynamics of the impeller and the motor characteristics. Speeds of up to 6,000 revolutions per minute are now possible thanks to the new motor and electronics configuration. Together with the optimized air routing of the fan, this permits a broad blower modulation range of up to 1:8. And so the gas-condensing boiler can operate economically even with a widely fluctuating heating demand.

What is the situation with regard to technical incorporation into applications?

Alongside efficient combustion, ease of incorporation into modern control systems was a further important aspect for us. All the important data are transferred via a standardized interface in the motor actuation system. These data can also be exchanged by way of a MODBUS interface. ●

FIND MORE INFORMATION
ABOUT THE G3G 315 AT:
ebmpapst.com/G3G315

6,000

revolutions per minute

can be achieved with the new motor and electronics configuration.

Up to 4,300 m³/h

can be delivered by the G3G 315 with free air flow
and max. 6,200 Pa achieved with full restriction.

Light and robust

The housing and
impeller of the
blower measuring
530 x 550 x 356
millimeters are made
of aluminum. The
motor and electronics
are protected
by a cover.

50 °C

is the maximum permissible flow medium
temperature. An ambient temperature of up to
60 °C is permissible for the motor.

Economical

The blower permits a modulation range of 1 : 8 and thus
covers a power range of 250 to 2,000 kW.



WOULD YOU HAVE RECOGNIZED IT? — THE G3G 315 PRE-MIX BLOWER HELPS TO PROVIDE AN EFFICIENT LOCAL HEATING SUPPLY. TAKE A LOOK INSIDE ↗