



This is how it works!

Intelligent servo drives keep things moving in the sorting system created by Beumer's intralogistics experts.

Drive technology special



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Dear readers,

Drive technology is a relatively young market segment in ebm-papst's portfolio of solutions. Nevertheless, we offer a wealth of experience and expertise for a wide range of requirements.

The world is in motion. And our solutions keep this motion going in many sectors, for example in intralogistics. Growth rates in the online retail sector require fast, compact and intelligent drives that enable a reliable flow of goods. In industry, automated guided vehicles link the warehouse to production. Precise, automated processes are required in machines. Precision, reliability, compactness and intelligence are the major requirements in medical technology. Decentralized, intelligent drive solutions in turn drive access system manufacturers forward.

For all these areas, we offer reliable, compact, powerful and efficient products with a high level of functional integration tailored to your individual requirements and wishes. Our team is always there to listen and always has the right solutions.

And to enable you to implement the right drive as quickly as possible, our modular drive system offers you the option of executing a wide selection of drive solutions that are available quickly. In this special edition, we give you an insight into our wide range of topics. Stay on the move!

Johannes Moosmann

DIVISION MANAGER
OF INDUSTRIAL DRIVE
TECHNOLOGY AT EBM-PAPST
ST. GEORGEN



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DRIVE TECHNOLOGY? PLEASE CONTACT US AT:
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The ArgoDrive



Automation





Ice blasting! Since 1986, the American company **COLD JET** has been developing and producing commercial cleaning systems that work with dry ice. Crushed and blown onto an uncleaned surface at high pressure, the solid carbon dioxide chills contamination: the by-product of industrial processes blasts away any contaminants, but leaves no traces of any kind. In addition, it is safe for the environment, non-conductive and suitable for use in foodstuffs. Cold Jet relies on intelligent drives from ebm-papst for the PCS 60 dry ice blaster. They make it possible for users to cut through wood sheets and remove the lettering from a business card with one and the same machine. *Find out everything about the PCS 60 and what Lego has to do with it here: mag.ebmpapst.com/coldjet*



Listen up for an outstanding sound experience! This is something music lovers have the joy of experiencing if they have a **TT3 RECORD PLAYER** from British hifi manufacturer **AUDIO NOTE** to call their own. The turntable made of ultra-light polycarbonate ensures the finest music enjoyment. This distinguishes it from standard devices, which are usually equipped with heavier, cheaper plates, which turn more easily but negatively affect the music quality. In the TT3, three VarioDrive compact motors from ebm-papst ensure that everything runs smoothly and silently, and that the light, 900-gram plate always rotates at the desired level of speed. So, put on a record, close your eyes, and enjoy! *Or read more here: mag.ebmpapst.com/audionote*





Automation



“Engineering power drives us forward”

Drive solutions are the hidden champions in applications: You cannot see them, but nothing works without them. Johannes Moosmann, Division Manager of Industrial Drive Technology at ebm-papst St. Georgen, provides an insight into the potential of industrial drive technology and the current market requirements.

Mr. Moosmann, what requirements are driving your customers forward most?

The range of requirements is as diverse as the various sectors for which we implement drive solutions, but there are a few overarching developments: drives must be ever more compact, powerful, intelligent and suitable for remote usage. In addition, all users have the common aim of implementing solutions that are as tailored as possible – as quickly as possible. We have the right answers in our product portfolio to respond to all these requirements.

But fast availability must be a topic that is particularly important at the moment?

It goes without saying that we are also feeling the effect of the current shortage of some components and materials around the world. Based on a well-developed supplier base and

our active supply chain management, we have been able to avoid major problems so far in this particular case. But these current challenges aside, our modular drive system in itself has enabled us to significantly speed up the availability of customer-specific drive solutions. Customers can compose the right drive from a modular product portfolio. Preferred types are ready to ship after 48 hours.

And this online portal covers all requirements?

It allows us to cover a very high percentage of each customer application’s requirements. If further adjustments are necessary, we rely on a drive system that already fits 80 percent of cases. However, it makes sense to have an individual discussion with customers before selecting a drive, because then we know which motor, with which transmission and which electronics, best suits the application’s

requirements. We find the ideal solution for this by exchanging ideas with the customer. We draw on experience from countless applications in various sectors.

Which industry are you currently focusing on most?

Intralogistics has been growing at an enormous speed since before the pandemic. In particular, online retail is booming. Some areas have increased their growth rates five-fold over the past three years. However, making goods ready for shipment quickly and reliably requires highly automated intralogistics, which in turn requires numerous drive systems and demands new, more efficient solutions. In particular, our compact, decentralized drives are used successfully here. Automated guided vehicles are becoming increasingly important in industry. With the new ArgoDrive driving/steering system,



“We work with our customers to develop solutions that drive them and us forward.”

Johannes Moosmann,
Division Manager of
Industrial Drive Technology
at ebm-papst St. Georgen

we have developed a revolutionary drive solution with infinite mobility for vehicles of exactly this kind and are currently in the process of successfully establishing them on the market.

How much does digitalization play a part here?

Drive solutions that contribute their intelligence are becoming increasingly important in many areas. This applies to intralogistics just as to medical technology and access automation, i.e. security locks, barriers, doors,

and general automation technology. The world is becoming increasingly networked: intelligent and decentralized solutions are a key element in this. We see ourselves as an enabler here. After all, our drives provide a lot of data: the motor detects many conditions as a ‘sensor’. This data supports higher-level systems, which then generate added value. For example, this facilitates condition monitoring or predictive maintenance.

How much of this is a dream of the future?

It is already a reality! Of course, it is based on

the drives and the network system planned for the customer speaking the same language.

For this purpose, we offer the ideal interface in accordance with the Industrial Ethernet standard. The most recent example is the drive-integrated EtherCAT interface for our ECI-63 internal rotor motors, which will be available soon. This is also a good example of how our engineering power drives us. We work with our customers to develop solutions that drive them and us forward. This corresponds to our claim “Engineering a better life.” ●

COMPANY

Witt Group

LOCATION

**Weiden,
Germany**

AREA OF APPLICATION

Intralogistics

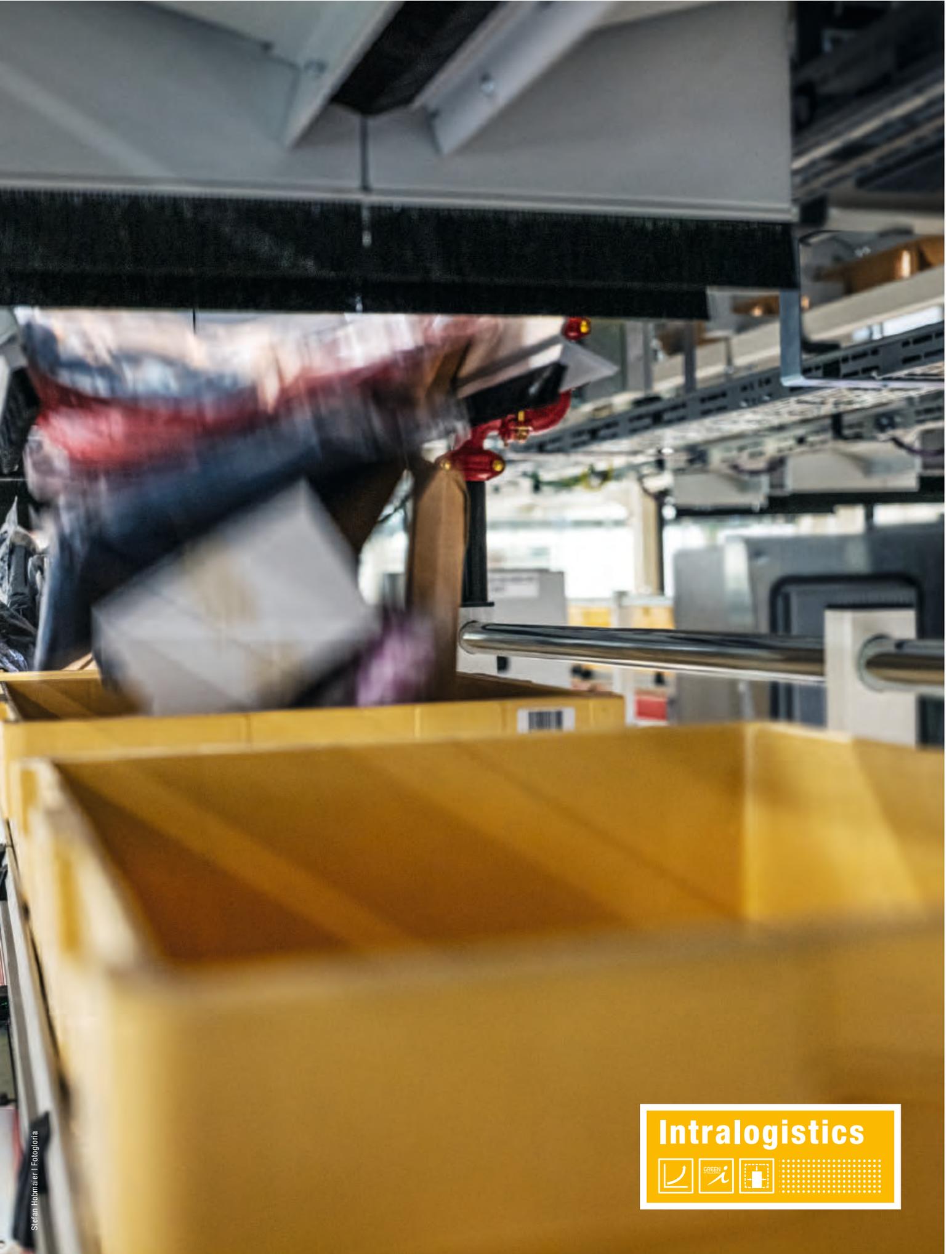
FOCUS OF THE PROJECT

**Efficiency, intelligence,
compactness**

Off to the basket!

Everything runs like clockwork at the shipping retailer Witt Group's logistics center: every article ends up in the right box. Sorting systems from the intralogistics specialist BEUMER Group show them the way. Servo drives from ebm-papst make sure the goods drop into the right basket. As a duo, they work extremely efficiently and intelligently with predictive maintenance and are particularly sustainable as a result.





Stefan Hobmaier | Fotoglora

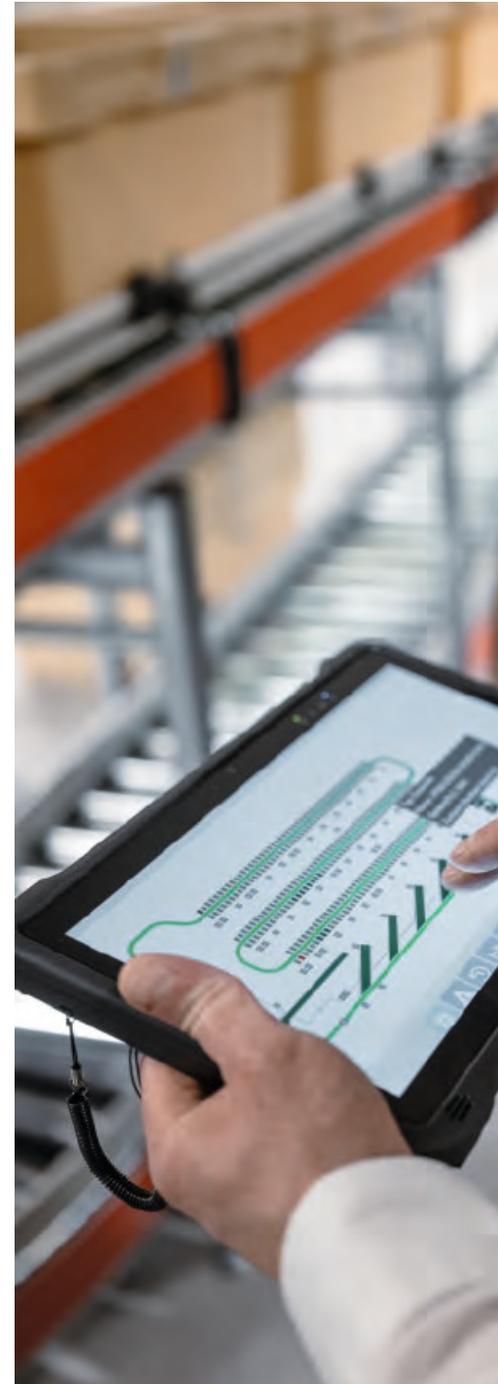
Intralogistics

A

At the logistics center in Weiden, everything is buzzing along without a hitch. Clothing and other items picked beforehand from mail-order company Witt Group arrive at the sorting system on the moving conveyor. There, the goods are scanned to identify them and are transported into the correct shipment tray at the system's outlets. Equipped

with flyers or give-aways, the collected items arrive at the next stage in the right-sized shipping carton and then go out to the customer. Order completed.

To ensure that everything runs smoothly, sophisticated technology is required, which also has to fulfill ever greater sustainability requirements.





“In addition to the desired efficiency and sustainability, the ECI drive from ebm-papst also offers that extra precision and intelligence.”

ANDRÉ SIELEMANN

CONTROLS MANAGER LOGISTIC SYSTEMS BEUMER GROUP



Important instrument: BEUMER monitors the status of the system with tablets. Machine data from ECI drives and other areas are prepared and used for optimum operation and predictive maintenance.

Increasing the sorting capacity in a sustainable way

This is what the Witt Group contacted the intralogistics experts BEUMER Group to order. They wanted to expand their existing logistics site in Weiden to increase their available sorting capacity by at least 50 percent. Their most important request was having a solution that is as efficient and sustainable as possible. “Our high-performance sorter was ideally suited to this challenge for the broadest mix of items. The BG Sorter Double-Belt can accommodate the shipment using one or two load carriers,” explains André Sielemann, Controls Manager Logistic Systems at the BEUMER Group. “It has efficient servo and variable frequency drives, non-contact energy transmission, real-time communication with the sorter, and intelligent automation technology for smart data.” To go the extra mile in terms of sustainability, BEUMER also used servo drives rather than pneumatic drives to open and close the flaps that convey the picked items from the sorting chambers into the shipment trays. Sielemann: “We decided to use the ECI drive from ebm-papst. In addition to the desired efficiency and sustainability, it also provides our systems with that extra amount of precision and intelligence.”

No sooner said than done. The 275-meter sorting system is now the heart of the logistics center in Weiden. It uses five feed units to pick up items and sorts them out again in over 290 sorting chambers per sorting wave. This constitutes over 10,000 items per hour, 20 hours a day, six days a week. The ECI drives are used as small helpers in each of the 290 flaps, which cause the buffer items from the sorting chamber to fall into the shipment tray for each order. They reliably control the flaps 2,000 to 4,000 times a day and send the orders to the right basket. But what makes the drives so sustainable and intelligent?

Replacing pneumatics with ECI

Switching from pneumatic to servo drives alone serves both efficiency and sustainability. It starts with the energy source. The servo drive has a much lower power requirement than compressed air generation. The difference is also noticeable when it comes to maintenance: if pneumatic solutions need to be readjusted after thousands of movements, servo drives are much less prone to maintenance and servicing, which gives them a longer product cycle.

This is automatically kind to the wallet: the amount of service costs are reduced and the total operating costs also decrease. “This saving is often crucial for systems that have long operating hours,” says Sielemann. “These little things have a big effect overall.” The ECI drive from ebm-papst tips the scales.

Smart ECI drive

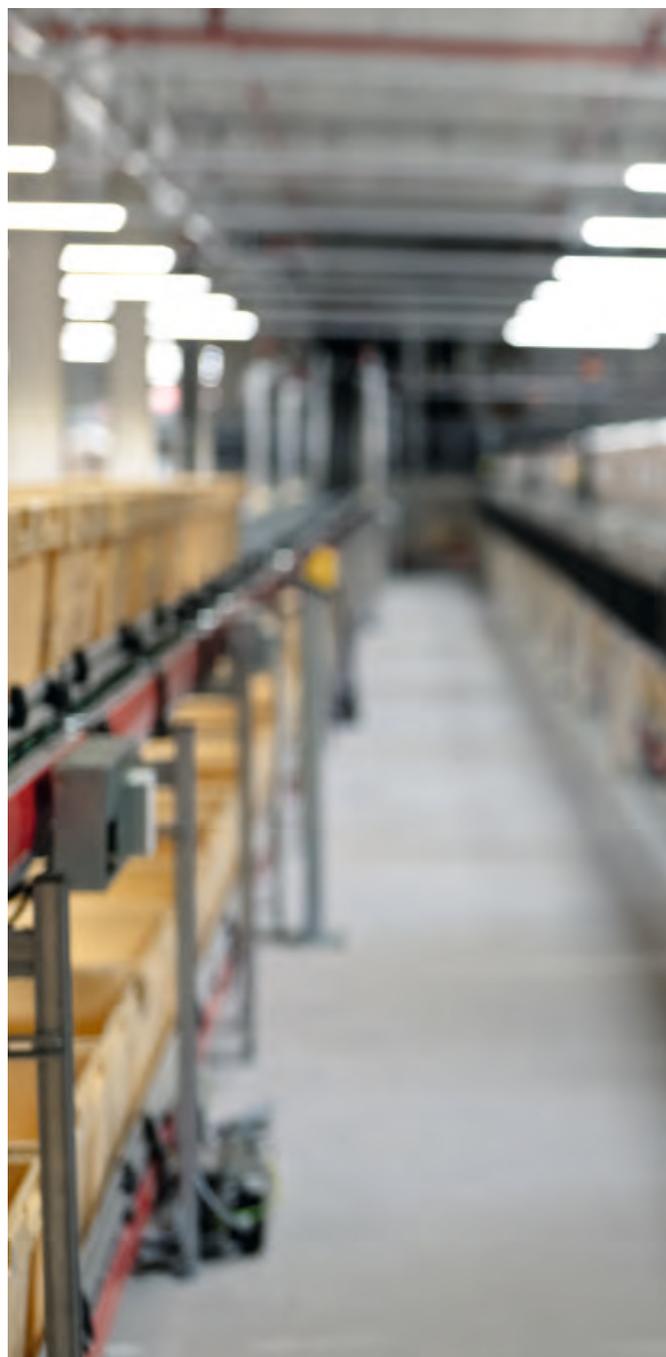
“The modern technology of our ECI servo drives creates the perfect interplay of efficiency and sustainability,” says Markus Psik, Head of Sales for Industrial Drive Technology at ebm-papst. “They have integrated control electronics and sensors, have IoT capability and, thanks to GreenIntelligence, are also state-of-the-art in terms of predictive maintenance.” With the ECI 63 drive from ebm-papst, BEUMER went all out. “This gave us a solution that is efficient from every perspective,” says Sielemann from BEUMER. But what can the intelligence of the drive do that others cannot? Firstly, the ECI 63 integrates the sensors that were previously separate and had to be maintained with pneumatic drives. The servo drive automatically detects the position of the flap and initiates its next action as a result. Its CAN bus interface makes it easier to control the entire field bus network. “Thanks to its small size, the ECI 63 is very suitable for intralogistics solutions such as this,” explains Psik from ebm-papst. “Also, the EtaCrown angular gearbox is especially efficient, helping to save energy.”

Go green with GreenIntelligence

The fine add-on: thanks to the ECI 63’s GreenIntelligence, both BEUMER and the Witt Group themselves have easier access to more machine data. This data is then processed by the BG Insight software solution and can be viewed at any time via smart data dashboards. “This means important added value for our systems when it comes to predictive maintenance. This makes our systems ever more intelligent

themselves,” says Sielemann. “In addition, it also helps technicians at the Witt Group to constantly improve technical availability.”

This is how the software errors are analyzed and warnings of potential faults are provided. A simple example: based on the machine data, the software detects that the flap always gets jammed when two specific articles are ordered together—a foot mat and a winter jacket. Thanks to its integrated sensors, the ECI drive detects the problem and stops so as not to damage the goods. The smart data dashboards report the error, giving the valuable information that these two items should be sorted separately in the future.



Productivity increased: with the new system, the Witt Group can dispatch 50 percent more packages than before.



“We are impressed
by the high level
of technical availability
during operation.”

MICHÈLE HILLE

—
HEAD OF MAINTENANCE
AT WITT GROUP

Flap open, flap closed!

Just half a year after the order was submitted, the Witt Group benefited from the new sorting system with the intelligent drive. After all, as a standard product, the drives were immediately available for delivery. “With the new packing and sorting system, we are combining completely new opportunities for compiling shipments,” says Michèle Hille from the Witt Group. “We are impressed by the high technical availability during operation combined with a robust delivery promise.” Switching to servo drives has paid off. “The change is in keeping with the times and increases the

sustainability a lot thanks to reduced energy consumption during operation,” says Hille. In recent decades, there have already been major steps in the development of individual components in many areas and this is expected to continue. “For us, collaborating with ebm-papst is not a one-hit-wonder,” says Sielemann. “We still want to further expand the sustainability and intelligence of our systems.” ●



WATCH THE SYSTEM
IN ACTION:
mag.ebmpapst.com/witt



Getting there more smoothly

Scratches, wear, noise—when workpiece carriers collide during assembly processes, both products and workers are harmed. So Stein Automation developed a system that moves parts from A to B gently.

Whether it is vacuum cleaners, exterior mirrors for cars, or fans that are being assembled, workpiece carrier transport systems quickly and efficiently bring parts in production environments from one step to the next in the assembly process. Stein Automation, based in the southwest German town of Villingen-Schwenningen, produces components for such systems or supplies fully assembled systems with integrated logistics management on request. Then customers can begin production right away, carrying out orders with just a few mouse clicks. The company offers two systems, STEIN 300 for weights up to 25 kilograms and STEIN 500 for weights up to 60 kilograms.

“Our specialty is Softmove technology for gentle collisions,” says Jürgen Noailles, Managing Director at Stein Automation. With other transport systems, workpiece carriers constantly run into stoppers or other workpiece carriers. Products get scratched or, in the worst case, broken. Transport system components wear quickly and annoying noises echo through the manufacturing facility. Softmove technology changes that. It moves the workpiece carriers at three speeds. When moving freely, they travel at maximum speed. If they detect congestion, they slow down. They switch to creep speed for the last two centimeters before a stopper or another workpiece carrier, so they always stop before reaching an obstacle. That makes production quieter, lowers the risk of injury for workers, and saves energy.

Safer transport for sensitive parts

“Avoiding vibrations is important, especially for sensitive or heavy parts,” says Noailles, “for example when liquids have to dry after being applied to electronics, and also for sensitive stators or rotors.” ebm-papst was

The ECI motor is installed on the sides of the conveyors.

Automation



AREA OF APPLICATION
Automation

FOCUS OF THE PROJECT
Compactness, efficiency, controllability, robustness



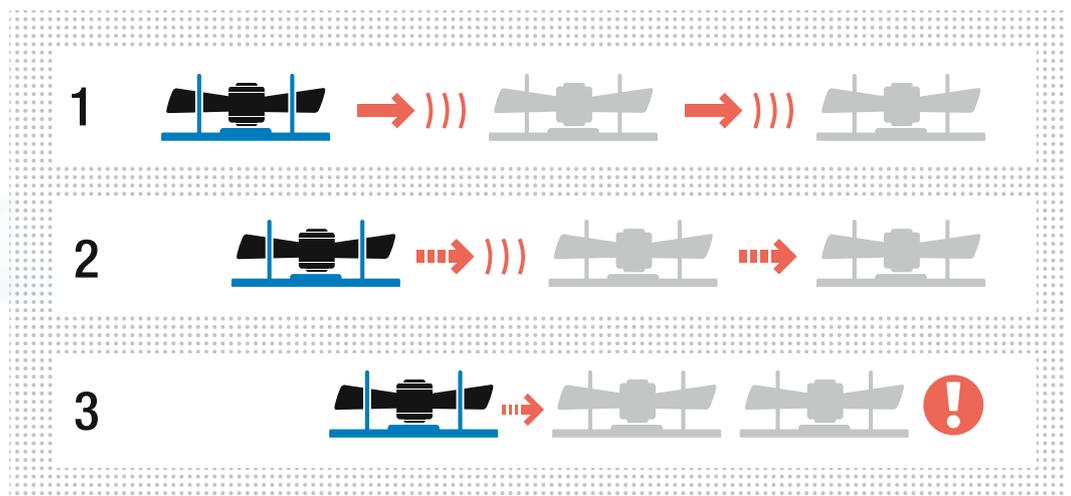
Softmove is quiet, lowers the risk of injury, and saves energy.

one of the first large customers to use Softmove; it was using workpiece carrier transport systems from Stein Automation as early as 1994. “When we visited the production facilities in Mulfingen many years ago, our contact there told us how important soft collisions were for them,” recalls Noailles. “Back then we still used AC gear motors and wondered whether we could also use motors from ebm-papst for our transport systems, to make them even more efficient.” So ebm-papst and Stein Automation looked for a motor that is compact and powerful and a considerable improvement over Stein’s former EC motor solution. It was also especially important for Stein Automation that the motor feature flexible control and adjustability. Stein found all that in the 63.20 K4 ECI motor with integrated control unit and attached worm gear. ECI motors also feature torque control and high overload capacity. Since the motor

regulates torque and current, workpieces of different weights can be transported at constant speed.

Customer-supplier relationship becomes a partnership

Stein Automation uses the motors in both systems, where they are mounted on the sides of the conveyors. The ebm-papst plant in St. Georgen supplies the motor for the workpiece carrier transport systems, which the fan and drive specialist then uses in its own production facilities. “A standard customer-supplier relationship developed into a true partnership,” says Noailles. “And that helps our customers reduce energy consumption by up to 80 percent and get their products to their destination safely.” ●



Softmove moves workpiece carriers at three speeds: **1** Maximum speed when moving freely. **2** Deceleration when congestion is detected. **3** Creep speed over the last two centimeters before the obstacle.

Access control



Stop — and go!

Viewed from above, China's expressways often look like ant trails. The toll station business is booming—at the same time, they are the most unpleasant bottleneck for traffic flow. The barrier expert NorthWest Devices alleviates these traffic jams with adaptable, reliable and durable barrier systems for every toll station, including a drive solution from ebm-papst.

COMPANY

NorthWest Devices

LOCATION

Mississauga, ON, Canada

AREA OF APPLICATION

Access control

FOCUS OF THE PROJECT

Compactness, efficiency, controllability



There is an acute danger of traffic jams at Chinese toll stations during the day. NorthWest Devices wants to ease traffic with its barrier systems.

In China, almost all expressways have tolls. Therefore, business is booming in toll stations, which control access to the longest network of expressways in the world. However, at peak times, they also lead to record-breaking traffic jams. And the number of cars on the road continues to increase. Access is controlled the traditional way: with toll booths and barriers.

“I have been working in this area of expressway infrastructure with my Chinese company ‘let’s technology’ for almost 20 years,” says Jin Chaodong, who is also CEO of NorthWest Devices, a specialist in toll barriers based in Canada. “The market is very stable and large in China. That is why, in 2016, I decided to use the Canadian spin-off

company NorthWest Devices to focus specifically on vehicle barriers.” According to his research, every Chinese province buys around 300 vehicle barriers every year, whether they are new ones or replacements for older systems. Extrapolated, this is likely to be around 7,000 to 8,000 units per year in total. Jin Chaodong bet on a new development, and won. But what was crucial for it to succeed on the market?

A question of appearance

“We found out that many things depend on our barriers’ drive,” Chaodong explains. “We needed a particularly small gear motor with



“Our aim was to develop barriers specifically for toll applications that combine reliability, durability and minimum maintenance work.”

JIN CHAODONG — CEO OF NORTHWEST DEVICES

high torque. To control our barriers individually, it was also important for us to obtain sufficient information from the motor.” ebm-papst was able to fulfill all three requirements at the same time. The size is primarily down to the appearance of the vehicle barriers. There is no room for a large drive in a small housing, but this is essential for the barriers’ space-saving construction and their delicate design. Nevertheless, the motor needs sufficient power and endurance to open and close the barrier arm, which is over three meters long: “Our aim was to develop barriers specifically for toll applications where reliability, durability and minimum maintenance work are of the utmost importance,” says Chaodong. “Barriers with drives that you install once and then no longer have to think about because they control access smoothly.”

Individual open and close functions

However, the most important requirement was the intelligence of the motor: “Our aim was to be able to check and change the speed of the motor at any time so that we could adapt to any toll situation,” says Chaodong. The barriers should open and close with precision at all times—at quiet times at night in Beijing, in particularly traffic-intensive rush hour periods, or at the start of the vacation season in Shanghai—to control the flow of traffic as effectively as possible and to reduce traffic jams. Information about the position of the motor, the barrier beam, the voltage and torque, for example, were key to achieving this.

Direct current under speed

“NorthWest Devices approached our American subsidiary with these requirements at the perfect time,” explains Stefan Rötzer, Market Manager Industrial Drive Technology at ebm-papst. “Our newly

developed Optimax 63 planetary gear series from St. Georgen was a perfect match.” In conjunction with the powerful VDC 3 49.15 drive unit with K4 electronics, it ensures very fast opening and closing cycles of 0.7 seconds each, with a service life of 10 million cycles. When viewed in the context of China’s toll stations, that means ten years of use without replacing the drive, with one car every 30 seconds. The field standard is only around half this amount. The DC external rotor motor is maintenance-free within those ten years.

The programming options also meet the barrier manufacturer’s requirements: “Our motor enables various speed and torque profiles. As desired, NorthWest was able to respond to the very special requirements of each toll station,” explains Rötzer. “With AC, that would mean buying a separate motor for every individual customer requirement.” And another advantage of DC technology is that, in the safety extra-low voltage range of 24 to 48 volts, contact does not necessarily mean danger to life.

Barriers up!

“At the moment, we have three kinds of barriers on the market for use on expressways,” Chaodong explains. “They have a 0.7-second, 0.9-second and 1.3-second opening and closing speed. That covers all the needs of toll stations.” For the coming year, NorthWest Devices is planning an additional product range to be even more efficient and precise. “I am looking forward to continuing the great collaboration with ebm-papst.” ●



DO YOU HAVE ANY QUESTIONS? FOR MORE INFORMATION, VISIT mag.ebmpapst.com/drives

COMPANY
ProMinent

LOCATION
Heidelberg, Germany

AREA OF APPLICATION
Automation

FOCUS OF THE PROJECT
Intelligence, controllability

Ready, set, bottle!

Before the finished smoothie ends up on your breakfast table, it first has to get into the bottle. Pieces of fruit in your smoothie may taste wonderful, but they pose a real challenge for the bottler. Bottling such thick liquids with precision is not so simple. The metering experts at ProMinent have found the right solution for this: The DULCO flex Control peristaltic metering pump makes sure that even thick liquids are perfectly portioned and placed in its packaging. Thanks to intelligent software, it independently controls the dosing volume. An EC drive from ebm-papst makes this possible. It is intelligent and provides the right speed depending on the dosage. ●

*Read the whole story at
mag.ebmpapst.com/prominent*



Automation



COMPANY

Huazh Intralogistics Technology

LOCATION

Nanjing, China

Shuttle service

Huazh Intralogistics Technology Co. Ltd. develops systems for automated warehouse logistics. Speed is the most important factor for the company based in Nanjing, China.

Endless lines of shelves, meter-high rows, conveyor belts, spiral chutes, and above all: goods as far as the eye can see. The prospect of someone having to find something in this labyrinth, having to wander through the aisles, all the while imagining customers drumming their fingers impatiently on the table, is unthinkable. Huazh Intralogistics Technology's solutions for warehouses and distribution centers ensure that this nightmare does not become a reality.

The pace in these places is now too fast for humans to achieve on their own. A pace that is not possible without automation. Huazh is driving it forward. Its expertise is based on five core areas: warehouse logistics planning, warehouse information systems, conveyor systems, automated systems for storing and retrieving piece goods and small items, and semi-automatic and fully automatic picking systems. At the heart of the system are the shuttles, which whiz through the warehouse on rails and independently pick up and unload

goods. The company, which is an offshoot of the University of Nanjing, has been developing them for almost 20 years.

Compact speedster

"This area is very promising and has grown rapidly in recent years," says Liu Feng. The R&D team leader at Huazh is responsible for the shuttles. "The key features of the shuttles are their small size and high speed—which saves lots of space and speeds up the picking and unloading of goods," says Feng.

To improve the latest generation of shuttles, which looks just like a red sports car, Huazh decided to switch from AC to DC motors and enlisted the support of ebm-papst. "We chose ebm-papst due to their high-quality products and excellent local service," says Feng. For various shuttle designs from Huazh, ebm-papst supplies the complete drive systems: brushless internal rotor motors from the ECI series, transmission, encoder, and electronics. ebm-papst supplies both the hardware and the software. The drive systems make the shuttle move forward on the rails, move the telescopic arm that grips the boxes of goods, and lift the boxes.

Agile team

For the system to be perfectly matched to the application, you need a team that works well together. ebm-papst service engineer Donny Tang took care of the implementation on site and spent a lot of time in the Huazh test lab making all

"The key features of the shuttles are their small size and high speed."

LIU FENG — R&D TEAM LEADER AT HUAZH

AREA OF APPLICATION
Intralogistics

FOCUS OF THE PROJECT
Compactness, efficiency, controllability, robustness



Autonomous shuttles make automated warehouses possible.

the necessary adjustments. But Feng also actively exchanged ideas with ebm-papst sales representative Tyrese Wu and team leader Mike Tang. His summary: “We held together and worked as a team.”

The greatest challenge with the shuttle project was, of course, the speed. Huazh gives itself only four to six weeks to deliver shuttles to its customers after receipt of the order. This also has an impact on its partner. ebm-papst talked to its own suppliers, set up new logistics concepts, and brought

its internal Supply Chain Improvement team on board. As Feng acknowledges, “ebm-papst responds quickly, enables a rapid exchange of information, and provides a buffer stock of components.” ●



DO YOU HAVE ANY QUESTIONS?
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Access control

Iain Port
at the metro
fast lane in
the showroom
at the British
Gunnebo site
in Maresfield

COMPANY

Gunnebo Entrance Control

LOCATION

**Maresfield, Great Britain
Lavis, Italy**

AREA OF APPLICATION

Access control

FOCUS OF THE PROJECT

**Compactness, efficiency,
intelligence**

Make an entrance

Whether it's at airports, in office buildings or in metro stations, Gunnebo Entrance Control makes sure that only those who are allowed to get in do get in. Instead of muscular security guards, the company uses high technology to do this.

U

Usually Iain Port, Gunnebo Entrance Control's R&D and Operations Director, and his colleague Nick Elkins, Design Engineer New Product Development, have a lot of opportunities to see their own security gates in action: Gunnebo, based in Göteborg, Sweden, has 5,800 employees spread across 31 countries. In normal times, business trips are commonplace.

Four countries, one project

The members of the Gunnebo team that has been working for the last couple of years to design a new security entrance gate are situated in various different parts of the global Gunnebo Entrance Control business unit. Port and Elkins work at the British Gunnebo site in Maresfield. The firmware developers Francisco Kedjagni and Daniele Zanini are based at the Gunnebo site in Lavis, Italy, and the production team based in China also played an important role. The global ebm-papst network also provided support.

The aim of the collaboration, which, before coronavirus, involved a lot of travel, was to optimize the performance of a Metro Fast Lane barrier (MFL), i.e. automatic ticket control gate, which can be found in many metro stations. Gunnebo usually develops complete gates, but this time the project involved redesigning the core component, the mechanism, which ensures that the swing doors open as quickly as possible when someone wants to get through with a valid ticket and then closes shut equally as quickly before the next person, and that anybody without a valid ticket is stopped and prevented from passing.

The physics pose a problem

There are a number of challenges that must be overcome when designing a fast-moving barrier. After all, they have to open and close very quickly, and there is a risk that it could make contact with a user whilst moving. Port explains: "The problem is the physics. The faster something moves, the more

**“The problem is the physics.
The faster something moves,
the more powerfully it can
close on someone.”**

IAIN PORT

R&D AND OPERATIONS DIRECTOR,
GUNNEBO ENTRANCE CONTROL

powerfully it can close on someone or something and potentially cause injury. But at Gunnebo we are committed to the safety of the user and therefore we need to find a way to move fast but with very low impact forces.” The experts from Gunnebo also have to provide a door that will stop people from

pushing through in normal operation but that will release to allow crowds to ‘push through’ in the case of panic, for example, “it must not become a blocking obstacle in an emergency,” says Elkins. The Gunnebo team got support from Germany to outsmart the physics: Market Manager Stefan Rötzer



Daniele Zanini was to find out how the motor, controller, gearbox, and firmware complement each other perfectly (top left). So small and already so smart: the ebm-papst drive requires a third less space than comparable products and knows when to stop moving the doors (top right).



Wanted a new solution for motor control: firmware developers Francisco Kedjagni and Daniele Zanini



Testing for secure passage: countless tests were carried out by design engineer Nick Elkins to find out when the doors give way.



and project engineer Dominik Häßler traveled from ebm-papst to Lavis many times. Because, as Francisco Kedjagni explains, “We have a number of existing products with really good performance but for this specific application we decided to work with ebm-papst to develop a new solution because they are experts in motor control and exhibited a real desire to collaborate to find the best solution to this challenge.”

Slim, speedy, and smart

But what constitutes the best drive in this case? It needs to be slim and speedy, and also smart. The idea behind it is that, if the motor and transmission don’t require much space, the gate can be made slimmer. “The ebm-papst drive requires a third less space than its competitor product. At the same time, it’s significantly more efficient and, therefore, consumes less energy,” Rötzer explains proudly. “This enables completely new approaches to designing the entire gate and meets the highest environmental standards.” The smaller motor frees up space in the gate cabinet for other peripheral equipment to be fitted and also makes the overall package appear more slimline and aesthetically pleasing.

To ensure that the impact force from the gate was not too high, the project team not only worked on making it speedy, but also worked on making it smart: with the new drive, the doors complete a

90 degree swivel movement at the blink of an eye. If the doors meet an obstacle, the motor detects the impact immediately through the onboard controller and reacts according to the customer’s preferred option: stop, reverse, or drive with low energy. “A clean bit of engineering work,” praises design engineer Elkins. The development process had been exceptionally smooth. “It’s not usually so easy to get the drawings or the CAD models you need, for example.” ●



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Medical technology



Clever cell incubators

The smart CO₂ incubators from the Chinese company Haier Biomedical allow cells to be cultivated under ideal conditions. The process requires high temperatures beforehand to create a sterile environment—meaning that heat-resistant components are necessary.

In many laboratories, CO₂ incubators have long since become a standard piece of equipment—whether for incubating human skin cells for skin transplants or for cultivating stem cells in the fight against cancer. The inconspicuous cabinets are an important tool for medical research and have become an indispensable part of many experiments.

High-tech cell division

The incubators are also used in the Chinese National Stem Cell Resource Bank. Their manufacturer, Haier Biomedical based in Qingdao, thought of everything that is needed for successfully cultivating cells. And it is quite a lot. After all, cells like a warm, humid, and slightly alkaline environment to be able to divide.

This is why the CO₂ incubators from Haier Biomedical's HCP series have an intelligent heating system that uses a total of 27 sensors to measure the inside temperature. If one area is too cold, the heating system reacts immediately and makes targeted adjustments through the individual inner walls. As a result, the heat in the incubators is constant, with minimal fluctuations of

0.3 degrees Celsius. The air humidity also remains at a consistently high level. Here, floor heating controls how much water evaporates from a tank and rises into the incubation chamber.

Infrared control sensors, in turn, ensure the perfect pH value in the incubators. These measure the CO₂ content in the air and make adjustments in the event of deviations. This means the pH value in the incubators is uniform and in a slightly alkaline range—the perfect conditions for many cells. And this remains the case, even if you open the door briefly. This is because the sensors detect changes immediately and restore the optimum conditions again within a few minutes.

Dry heat to prevent germs

However, the best conditions are no help if germs also multiply alongside the cells, thereby distorting experiments. For this reason, the incubators have a self-cleaning option before use. The interiors of the CO₂ incubators from Haier Biomedical are cleaned at the touch of a button using dry heat at 180 degrees Celsius. So stubborn germs do



COMPANY

Haier Biomedical

LOCATION

Qingdao, China

AREA OF APPLICATION

Medical technology

FOCUS OF THE PROJECT

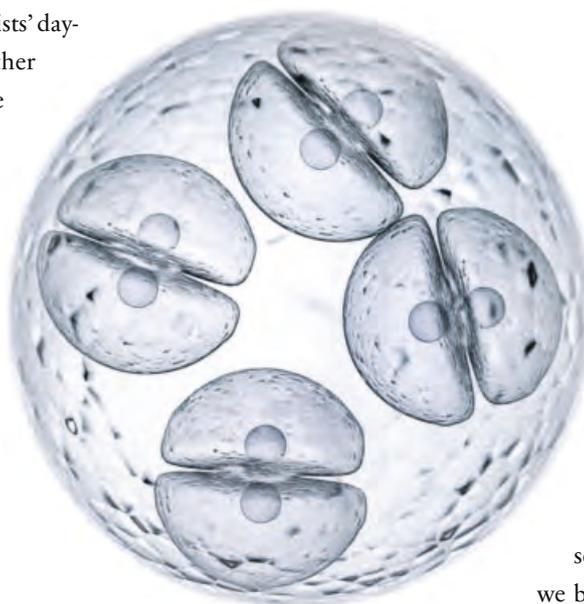
Noise, heat

not stand a chance. This all means the Chinese company's incubators are particularly sterile—even in comparison with the competition, which relies on less effective UV sterilization, for example.

But sterilization at high temperatures also poses a challenge: the sensitive components of the incubator need heat protection. This also applies to the VDC43.10 external rotor motor from ebm-papst, which in conjunction with a removable fan wheel ensures the air circulates in the CO₂ incubator. The EC motor is therefore equipped with a long stainless steel shaft and a Teflon-sealed ball bearing. The motor and fan wheel still run very quietly, making them perfect for a laboratory where scientists are concentrating on their experiments.

Digital cell monitoring

On the topic of concentration—the CO₂ incubators from Haier Biomedical make the scientists' day-to-day laboratory work easier in another way. The company's incubators can be operated using a touch display and be



integrated into the Internet of Things, for example. This means that the incubators independently transmit data to a central computer for evaluation or report problems with the cell supply. The smart incubators can therefore also be monitored and controlled remotely using an app. This enables the lead scientist to check from home whether their long-term experiment is still running. This is not only good for science, but also good for all of us. Because we benefit with our health from the progress and findings in research. ●



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Drive to go

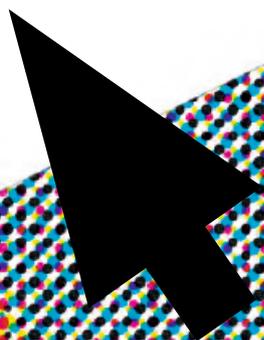
A suitable drive solution
that is also available quickly?
That is every user's dream.
The modular drive system from
ebm-papst makes it a reality.

MODULAR DRIVE SYSTEM TO GO:
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EXACTLY WHICH MODULES AND OPTIONS
THE MODULAR DRIVE SYSTEM HAS TO OFFER.



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Anyone needing an individual drive solution in the past often had to wait a long time for it, as the tailored drive had to be developed first. It is often the heart of an application and is therefore usually required urgently.

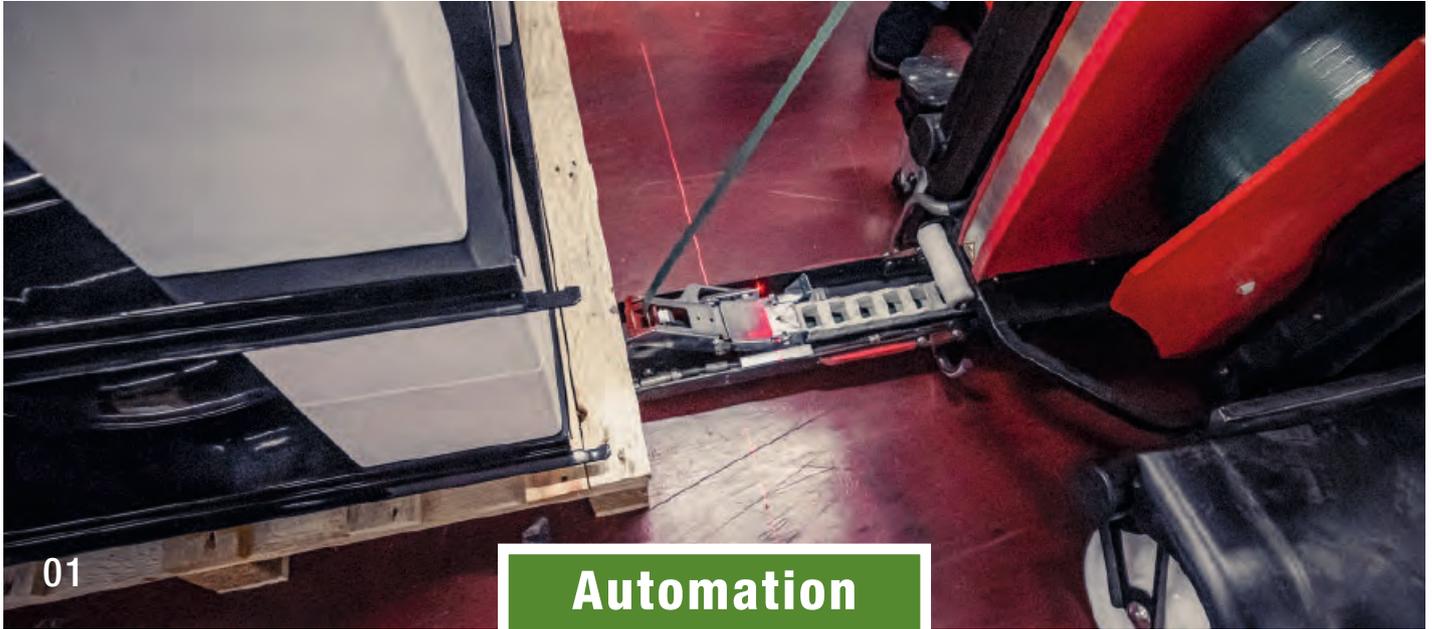
ebm-papst solves this dilemma with its modular drive system. It is possible to assemble and order the individual modules of a drive online like a modular system: the motor with the right power, planetary gearhead, spur gear or angular gearboxes,

brakes, encoders and electronics is ready to order. Preferred types are ready to ship after 48 hours: an individual drive to go that is characterized by high quality and an attractive price-performance ratio in addition to fast availability.

The modular drive system already supplies many tailored solutions. Once the application has requirements that go beyond the system's current remit of variants, the development can be built upon a drive that already fits 80 percent of cases. ●

AREA OF APPLICATION
Automation

FOCUS OF THE PROJECT
Robustness, compactness, efficiency



Automation



Click, don't bend!

Bending incorrectly or too frequently causes backaches: this affects logistics employees in particular. That is why ErgoPack develops ergonomic strapping machines.



COMPANY
ErgoPack

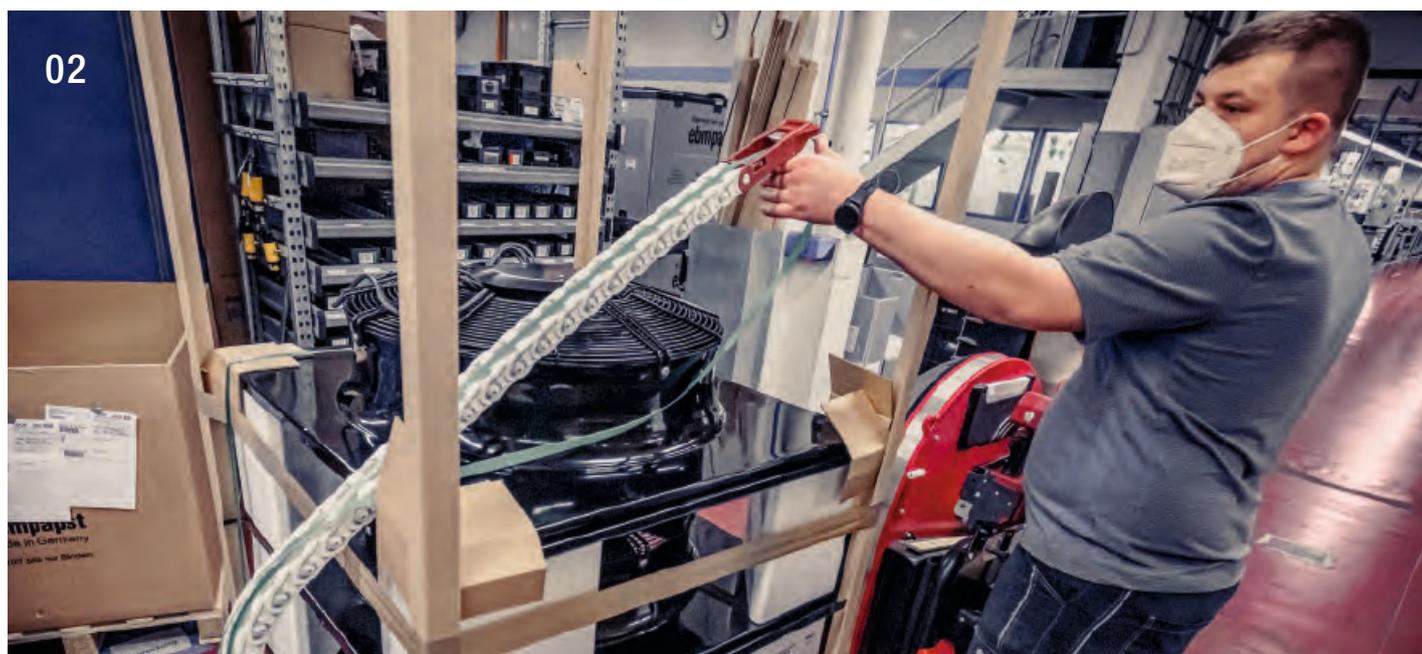
LOCATION
Lauingen, Germany

Faster, more flexible and kinder to the back: that is what our colleagues from Logistics at ebm-papst in Muldingen have concluded about the ErgoPack Air. They no longer have to bend down when strapping pallets. As these have to be strapped at least twice, the employees had to bend twice per strap: once to guide the strap under the pallet to the other side, and once to pick it up on the other side and guide it upward. At this point, the two ends used to have to be welded with a heavy manual tool. So, this meant bending four times for one pallet. With 50 pallets a day and around 200 working days per year, this would mean 40,000 times. “Backaches are almost inevitable,” says Boris Schulze,

There, the machine ‘reaches’ to the other end for them, and the band is welded using the fastening device on the Ergo-Pack Air. The ErgoPack was awarded the AGR seal by the Gesunder Rücken e.V. campaign (healthy backs campaign) for its back-friendly method.

The transmission has to transfer forces quickly and reliably

There are EtaCrown angular gearboxes from ebm-papst in the ErgoPack Air. For more than ten years, ErgoPack has been relying on the robust, space-saving crown gearbox, which has to reliably transfer torque from the motor to



02
Strapping parcels quickly and conveniently — an ErgoPack Air is also used at ebm-papst in Muldingen.

Sales Manager at ErgoPack, the manufacturer of ergonomic devices for pallet strapping. The company, based in Lauingen, Bavaria, makes life much easier for logistics workers with devices such as the ErgoPack Air. “We want to allow the workers to strap pallets in an ergonomic, simple, safe and mobile way,” says Schulze. Everything starts at the touch of a button. Once the employee has moved the machine towards a pallet, it starts to auto-detect the pallet using a laser. Clicking on the joystick on the console moves out a chain lance that easily pushes under the pallet, regardless of whether it is on the floor or raised. “We can deal with pallets with a depth of up to 2.4 meters,” says Schulze. Once on the other side of the pallet, the lance moves upwards at a 90-degree angle and guides the strapping tape with it, which the employee then grabs and returns to the machine.

allow the chain to extend. The transmission’s particularly durable output shafts are made of hardened and ground case-hardened steel; the torque is transmitted via a feather key connection as standard. As the contact between the pinion and the output gear is a roller contact, hardly any friction losses occur. “We have outstanding efficiency,” says Mario Rudmann, Regional Sales Manager at ebm-papst.

In logistics at ebm-papst, too, the specialist staff are pleased to no longer have to bend down and run around the package. ●



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COMPANY

Tünkers Maschinenbau GmbH

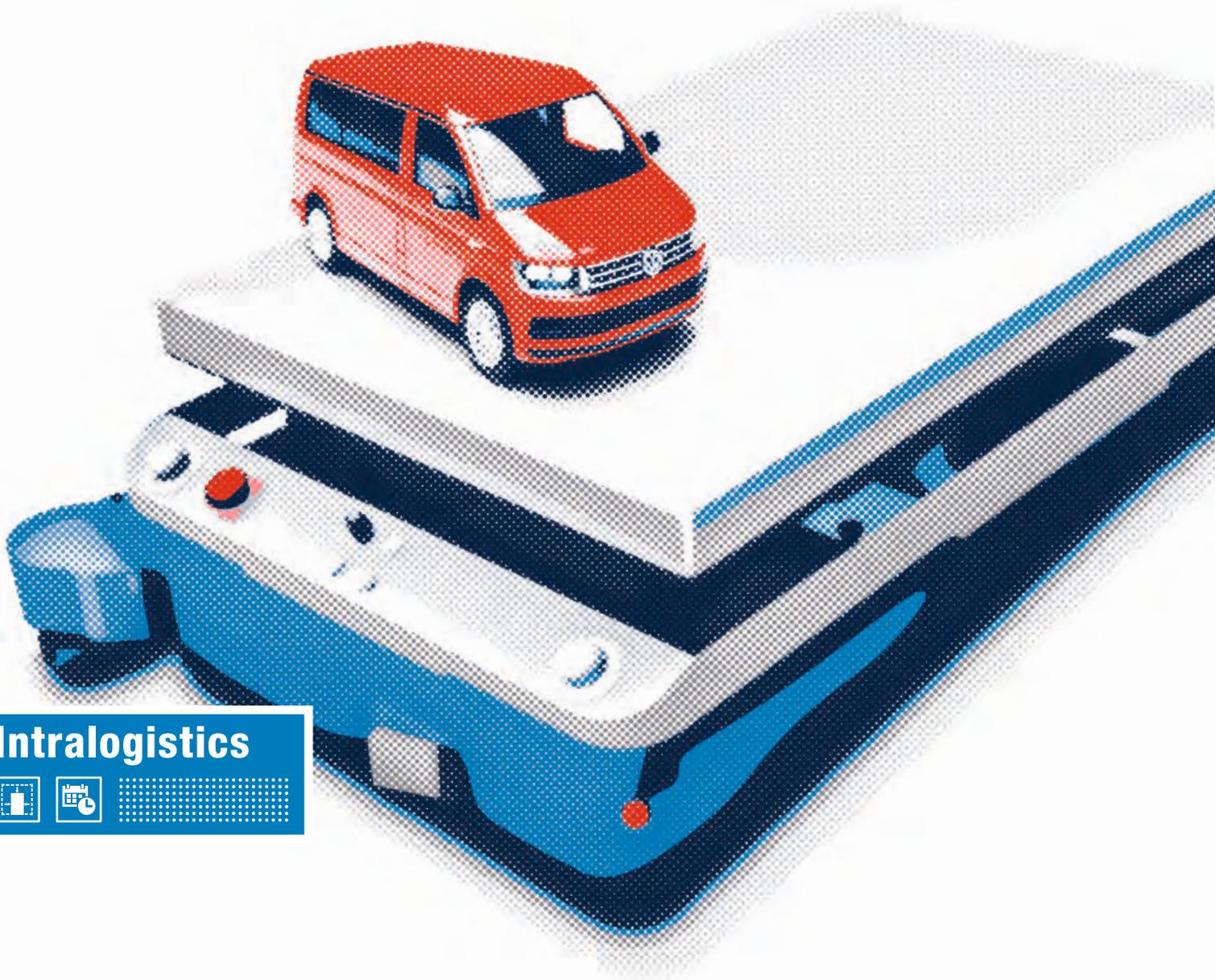
LOCATION

Ratingen, Germany

AREA OF APPLICATION

Intralogistics

FOCUS OF THE PROJECT

Compactness, time**Intralogistics**

Just in time

The future of automotive production? It is autonomous. This is what the latest invention from Tünkers is based on: the automated guided vehicle with integrated scissor lift.



The automated guided vehicle with integrated scissor lift automatically drives to a just-in-sequence trolley. It drives underneath it and lifts it. The automated guided vehicle detects the trolley ID and goods, and transports it to the target position.

T

The market for automated guided vehicles is booming. The driving force behind this development is that production and logistics within the automotive sector are becoming increasingly flexible. The rigid chains within production lines are breaking up more and more, and different vehicle types are produced in quick succession. The solution: automated guided vehicles. In a flexible way, they take the material required and deliver it not only to the next station, but also to the next one after that, as well—completely autonomously and just in time.

Unnoticed power

But what can you do when the object to be transported is heavy and there is limited room for power delivery? This is precisely the case in the manufacturing facilities of the automotive industry. The components for the next production step are stored on so-called just-in-sequence trolleys. There is just 400 millimeters of space between them, which is not much if you consider that the automated guided vehicle has to lift several hundred kilograms and transport it to the production line.

An ingenious idea was required—something which TÜNKERS is known for. In-house, the company developed a flat scissor lift which can be built on a automated guided vehicle, and can thereby autonomously take just-in-time trolleys from A to B. Truly a powerhouse with a high degree of stability in the tightest of spaces. “An enormous force is exerted on our scissor lift for a short time. In less than seven seconds, it lifts and lowers 500 to 1,000 kilograms. So that this runs smoothly, we needed a motor with the largest possible torques in the smallest installation space,” explains Rolf Eppers, designer of the automated guided vehicle scissor lift. “Every day, we were playing Tetris over and over. Because of its small size, the drive from ebm-papst helped us to manage everything—and lift everything,” adds Wolfgang Kieninger, Design Manager for automated guided vehicle systems.

A powerful motor in the smallest space

The ECI 80 motor from ebm-papst meets these requirements: It does not require a large amount of installation space, but despite this achieves high torques at 24 volts, and is able to provide three times its power for short periods. The fast availability of the product was also important. Here ebm-papst was also the right partner. This is because the ECI 80 is part of a modular system; it was only the cover that had to be adapted to the higher splash water protection level IP54. The electronics are mounted on the underside of the lifting cover—making it autonomous. So that the scissor lift can be used flexibly, the developers at TÜNKERS decided to attach it to the automated guided vehicle with just a few screws so that it can be easily dismantled.

Transport of tomorrow

The first automated guided vehicle scissor lifts are already driving round the cockpit manufacturing facility at VW in Hanover, taking sequenced parts to the right shoring point and to the right vehicle. And beyond this? “In the field of automated guided vehicles, we are anticipating high growth rates of over 16 percent,” explains Matthias Heina, Product Manager for automated guided vehicles. “To cover the increased inquiries, we are building a new assembly hall with 5,000 square meters in Ratingen.” This is because, along with the automated guided vehicle scissor lift, TÜNKERS has already developed four other automated guided vehicles for logistics and manufacturing facilities. And one thing is for sure according to the trend—more will follow. ●



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A quantum of voltage

Extra-low voltage and separated extra-low voltage are not the same. Because the voltage applied to industrial drives for safety reasons is not a general issue but always a specific one.

Extra-low voltage is a low voltage range and is defined as a maximum 120 V DC voltage or a maximum of 50 V AC. Although extra-low voltage is not harmless for humans and animals, it is definitely not life-threatening. And extra-low voltage in the surrounding area can also be useful for sensitive devices. 24 or 48 V DC are standard for industrial drives from ebm-papst. Of course, this does not mean that the motors have to be connected to exactly this voltage. In fact, rectifiers and transformers in power supply units ensure safety and customers can use supply connections or batteries in most cases.

A surgeon with calm hands

But what voltage is now considered a separated extra-low voltage? There are no general answers to this question, only specific answers. Because there is no classic definition for separated extra-low voltage, just the idea that the voltage must be completely safe, which simply depends on the application in question. An electrically operated operating table, for example, has to fulfill particularly high requirements to protect the patient. Although 120 V DC voltage is considered to be (almost harmless) low voltage on paper, even small muscle reflexes caused by electricity could be fatal for patients or surgeons. The safety concept and device design in place

are also decisive to choosing the right voltage: with a suitable isolation concept, the drives from the modular drive system from ebm-papst suit any application.

Perfect for self-driving systems

Extra-low voltage is not associated with a reduction in performance, as you might think. ebm-papst drives with extra-low voltage are used, among other things, to drive automated guided vehicles (AGV) in intralogistics and are still powerful, efficient and compact. With AGVs, customers do not need to make any compromises on performance and nevertheless can be sure that the vehicles pose no risk of electric shock.

Less risk = less effort

If customers can easily rely on extra-low voltage drives for their applications, they can also benefit in other ways that are not obvious at first glance: for example, personnel without qualifications in dealing with low voltage may also carry out commissioning if this is permitted by the safety and risk assessment. And more simple system and factory concepts are possible for assembly robots, for example. Therefore, extra-low voltage proves itself several times over, and the right separated extra-low voltage even more so. ●



Philipp Rauch,
Market Manager OEM Industrial
Drive Technology at ebm-papst
in St. Georgen, does not let
much voltage occur.

OVERLOAD REQUIRED

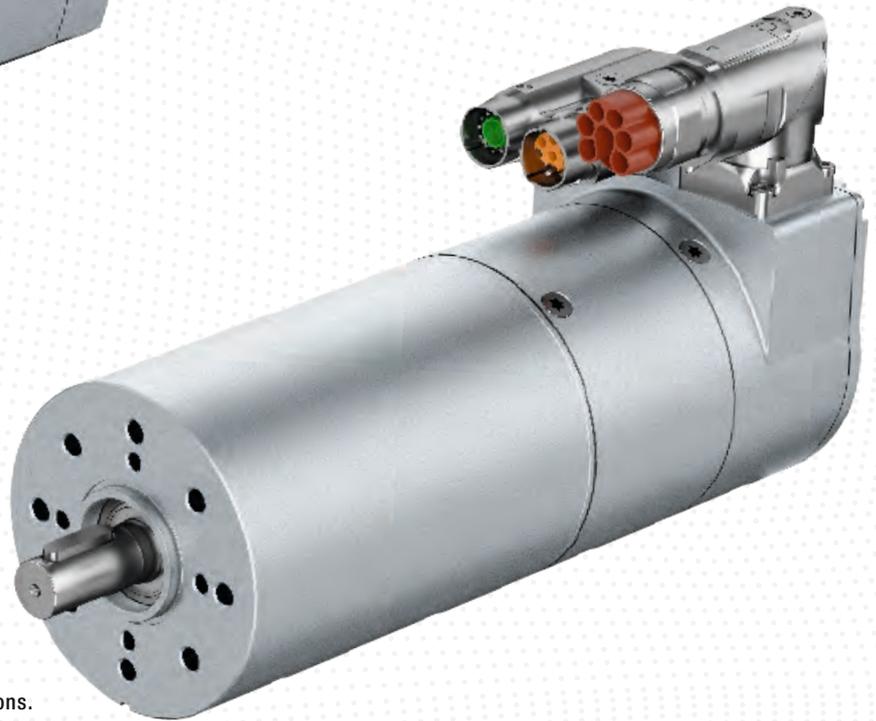


Optimax stands for an extremely robust planetary gear that has overload capability. Now, with the Optimax 80, a variant is also available for motors with a size of 80 millimeters. Like the other models, the transmission comes with degree of protection IP54 as standard and is available in one or two-stage versions.
ebmpapst.com/optimax

TEAM PLAYERS

The SIMATIC MICRO-DRIVE is the new servo drive system for the separated extra-low voltage range. Thanks to a product partner range with Siemens, ebm-papst is offering the SIMATIC ECI motor drive controller with iQ encoder technology and an output of 50 to 750 watts in various sizes and with different transmissions.

ebmpapst.com/simatic



READY FOR ETHERCAT

The ECI 63 internal rotor motors from the modular drive system from ebm-papst will be available with EtherCAT interface soon. This is made possible by the expansion of the integrated K5 electronics. The ECI 63 series is ideal for decentralized drive solutions in which multiple axes have to be synchronized.

ebmpapst.com/eci



» We bring maximum mobility to intralogistics «



Mr. Schumacher, why does intralogistics need maximum mobility?

In the past, there were rigid conveyor belts and linear production lines. Modern production has a modular structure so that products can be produced in small batch sizes and with high variance. Automated guided vehicles have to keep up with this. They are expected to be able to navigate freely and to offer unrestricted free-range mobility rather than driving along fixed line markings on the floor. To put it in a nutshell: they must have maximum flexibility and therefore also have to be able to move as much as possible.

Does the ArgoDrive solve this problem?

Yes, it was developed specifically for this application. Our ArgoDrive driving/steering system combines propulsion and steering functions in one module. It is a complete unit consisting of motor, transmission, steering, high-resolution sensors, and all the necessary connections. It is implemented in automated guided vehicles with a total vehicle weight of up to 2,000 kilograms to drive around unexpected obstacles, effortlessly overcome ten percent inclines and move easily and precisely in very tight environments, even from a stationary position and when subjected to very heavy loads. The infinite steering angle gives vehicles equipped with ArgoDrive

Strong, clever but above all extremely flexible: these are the key strengths of the ArgoDrive omnidirectional drive system, says Patrick Schumacher, Head of Product Management in the Industrial Drive Technology business unit at ebm-papst.

space-saving omnidirectional mobility in every situation, which is required for fine positioning at the machine and at material transfer stations in particular.

How did you implement these benefits in the ArgoDrive from a technical perspective?

Two driving/steering systems, diagonally on the left and right side of the AGV, guarantee full omnidirectionality. Two additional freely moving support wheels, also arranged diagonally, ensure stability. Depending on the size of AGV and the weight of the goods to be moved, it is also possible to install three or four driving/steering systems. This enables large loads to be achieved even if there are inclines.

We offer the ArgoDrive in the Light, Standard, and Heavy versions for carrying loads up to 100, 300, or 500 kilograms in order to meet every requirement for moving masses, for braking distances or for managing inclines in a way that is scalable. For example, four driving/steering systems in the Heavy version allow a total vehicle weight of up to two metric tons. ●



MORE INFORMATION CAN BE FOUND ON OUR WEBSITE:

ebmpapst.com/argodrive

500 kg

load capacity per ArgoDrive

10%

incline without effort



Infinite maneuverability

WOULD YOU HAVE RECOGNIZED IT? — THE ARGODRIVE, THE BEST CHOICE FOR AUTOMATED GUIDED VEHICLES. TAKE A LOOK INSIDE! ↑



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Gernot Walter