

KAESER report

A Magazine for the Production Industry

Spring 2023



**HANNOVER
MESSE**

17th to the 21st of April

75 years of the
Hannover Messe

Tradition & Innovation



Smart, safe, worry-free
Exceptional cost transparency
with Contracting



A promise is a promise
Custom-made compressed
air system



Simulation and reality
Expert advice makes all the
difference

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Custom-made compressed air system



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Manufacturing-X for resilience, sustainability, and competitive strength

As the next logical advancement in Industrie 4.0, Manufacturing-X is an intelligent networking of the entire value chain in industry that creates a sustainable ecosystem in which cross-industry communication can take place. By jointly defining binding standards for data models, knowledge in the form of data can be understood and shared, which leads to high synergies.

This creates an image of the value chain and value networks that seamlessly integrate and link all phases of development, production, assembly, and value-adding services. The aim is then to be able to react quickly and effectively to changes in the supply of raw materials and energy, supply chains and clarity, as well as transparency, across all stages of the value chain.

Processes and resource availability can therefore be optimized through effective cooperation of all actors in the value chain. This increases company resilience, even in the event of unforeseeable circumstances. Above all, there is the potential to create



Mr. Frank Mueller, President of
Kaeser Compressors, Inc.

new business models, achieve transparency relating to the CO₂ footprint, create a closed circular economy, and increase the efficiency of all processes, which in turn strengthens company sustainability. Digital innovations can also be implemented more quickly and efficiently, thereby improving company competitiveness. This creates growth, together with new, secure, and high-level jobs.

The Hannover Messe 2023 is the ideal platform to showcase advanced digitalization strategies such as Manufacturing-X, new business models and innovative, efficient, and reliable products as a creative and synergetic complement.

WE LOOK FORWARD TO WELCOMING YOU.

75 years of the Hannover Fair



When the “Deutsche Messe” was founded in Hanover in 1947, during the post-war period, no one could have imagined its future success. Now, 75 years later, the Hannover Messe is still considered- perhaps more than ever - the premier showcase for industrial innovation. It has played a lasting role in shaping industrial change for more than seven decades. KAESER KOMPRESSOREN has been among the regular exhibitors since 1954.

The Deutsche Messe- und Ausstellungs-AG was founded in Hannover in 1947 and brought investments worth millions to the city, which was devastated as a result of the Second World War. Over 21 days, approximately 736,000 visitors from 53 countries came to Hannover and export contracts totalling almost 32 million US dollars were signed. In the following years, the fair became symbolic of the German economic miracle and attracted ever-greater numbers of foreign exhibitors to the event, which was now known as the “Deutsche Industrie-Messe” (German Industrial Fair). Attendance grew steadily and by the early 1960's, the trade show was attracting more than one million visitors annually. The name was changed again in 1961 to the “Hannover Messe”, which immediately reflected how proud the city was, and still is, of its contribution to the industrial boom.

The international business of the “Deutsche Messe” grew steadily and by 1985 there was already federal participation in Paris, New York, and Melbourne. These activities were subsequently consolidated into a subsidiary company: The HANNOVER MESSE INTERNATIONAL GmbH, later Hannover Fairs International GmbH.

Another milestone was marked in 1988, when the heads of EC member states met on the exhibition grounds and set a course for the single market within the European Community and for the later currency union.

To enable even faster growth in the international market, the



A find from the early days of the Hannover Fair.



Image: Deutsche Messe AG

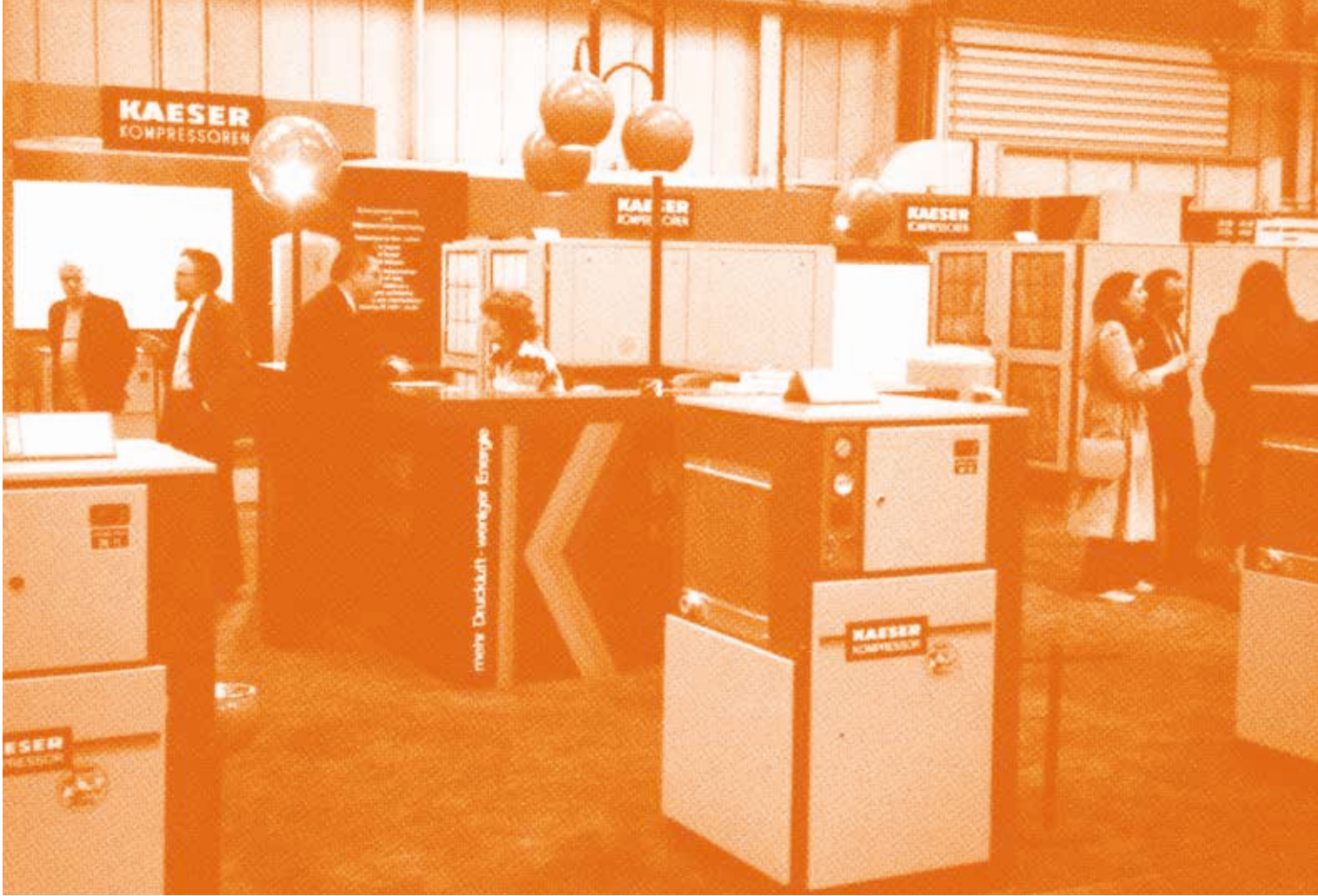
The fair logo from 1954, KAESER's first exhibition year.



Image: Deutsche Messe AG

A place to meet: Fair visitors Thomas Kaeser (Chairman of KAESER KOMPRESSOREN)





KAESER has been among the regular exhibitors since 1954.

YEARS

#WeLoveTradeFairs

DEUTSCHE MESSE

1947–2022

*(in conversation with
of the Board).*



*KAESER's exhibition stand has always been
a highlight of the fair.*



Deutsche Messe combined forces with the second leading European trade fair organizer, Fiera Milano, as a joint venture in 2008. The companies aimed to jointly establish a foothold in the growth markets of Russia, China, and India more quickly, while mutually benefiting from market position and know-how.

A signpost for industrial change

The Hannover Fair has long been a guidepost and driving force for globally and digitally networked industry. The megatrends of industrialization, digitalization, and climate protection have been main themes on the fair's agenda for many years. KAESER has been there right from the early years of the Hannover Fair and aligns its diverse product portfolio with the core theme: "More compressed air for less energy". Now, as then, this remains the KAESER motto and clearly conveys that sustainability is deeply rooted in the company philosophy of the Coburg-based systems provider.

Whether it be reciprocating compressors, industrial rotary screw compressors with associated compressed air treatment, or dry-running rotary screw and rotary lobe blowers for oil-free, low-pressure air, KAESER is dedicated to providing products and solutions that deliver ever-greater efficiency, performance and energy-savings. This will be showcased as always by various innovative exhibits at the Hannover Fair in 2023:

WORLD PREMIERE



*A leading performer in terms of energy efficiency:
The new CSG rotary screw compressor.*



*Innovation in sustainability: CSD rotary screw
compressor with synchronous reluctance motor and
IE5 efficiency class.*

The latest from the world of rotary screw compressors

The new **CSG** series (**Fig.1**) of oil-free rotary screw compressors (rated power from 50 to 120 hp flow rate up to 530 cfm) will make its debut at the KAESER booth in Hannover. Featuring IE5-efficiency class synchronous reluctance motors and proprietary rotary screw airends developed and manufactured by KAESER, these high-performance systems provide class-leading efficiency and are also notable for their sustainable service features. There are also numerous innovations for fluid-cooled rotary screw compressors, such as the new **CSD** (**Fig.2**) and (**Fig.3**) for example, that also focus squarely on sustainability. These include newly developed rotary screw airends with further-refined SIGMA profile rotors and the highest drive system energy efficiency class (IE4 for fixed-speed compressors, IE5 and IES2 for frequency-controlled compressors). These enhancements are

topped off by additional pressure variants for the fixed-speed versions of the CSD packages. This allows better adaptation to the individual network pressure required by the customer, resulting in a higher flow rate and ultimately up to 20% more compressed air compared to previous models. Another highlight of this new series is the speed-controlled fan unit, which saves additional energy when less cooling air is required.

New developments for the water industry

KAESER sets the new standard when it comes to efficiency and space savings with the new **FBS 720** series (**Fig.4**) of low-pressure rotary screw blowers. The SFC version is equipped with an integrated frequency converter with a synchronous reluctance motor. As a slip-free motor, this design combines the advantages of highly efficient permanent magnet motors and robust asynchronous motors. Flow rate is adjusted to actu-

al demand through variable speed. The new FBS 720 series, up to 150 hp has a maximum usable flow rate of 2545 cfm and impresses with its modern package design, which also allows for side-by-side installation.

New CALOSEC dryer

The new heat regenerative CALOSEC desiccant dryers are another highlight of the show. This new flagship brand encompasses three drying methods: Blower Purge (CSP series), Zero Purge (CSA series), and Closed Loop (CSL series). The various methods provide efficient solutions for pressure dew points down to -94°F in the 340 to 5500 cfm flow rate range. All models include the network-capable CALOSEC CONTROL controller, a touch display, and pressure dew point control. The dryers impress with their high-quality standard equipment, which also includes high-temperature galvanized piping and individual fittings. In addition, the CSA and CSL series are equipped with premium Silicagel Eco desic-

PREMIERES



CSDX with the newly developed rotary screw airend featuring further-refined SIGMA profile rotors.



New and advanced FBS 720 series low-pressure rotary screw blower.

cant, which provides energy savings of more than 15%. An extensive range of options also helps the new CALOSEC system module to significantly broaden the spectrum of efficient compressed air solutions that KAESER can offer.

Holistic approach

One of the secrets of KAESER's success lies in the comprehensive and holistic approach that is so typical of the company when it comes to compressed air supply: instead of just selling machines, the Coburg-based systems provider supplies custom-made complete solutions tailored to the user's specific volume and quality requirements. The goal is to achieve ever-increasing transparency of associated processes and connections so they can be clearly understood and create the basis for ever-better prediction models. Prerequisites for this new approach are the new, globally standardized, and high-quality KAESER measurement technology, compressed air system monitoring via sensors, centralized monitoring (i.e. SIGMA AIR MANAGER 4.0), and professional networking of components via the SIGMA NETWORK, where permanent data exchange can take place. This creates the foundation for data-based business models with which customers can be offered proactive service and various innovative services.

We look forward to seeing you

There's a lot to see! Learn more about all of the products and

services KAESER has to offer by speaking with the compressed air experts from Coburg. We look forward to seeing you in Hannover, where we can introduce you to the latest technology innovations and exchange perspectives on future trends.





ARTiBack: Bread at its best

A passion for

ARTiBack's bread is healthy and innovative, yet is also steeped in tradition. It is perfectly in tune with the times since an ever-increasing number of consumers are seeking modern foods with a variety of taste options that meet all the criteria of a healthy lifestyle. Bread, according to the ARTiBack purity principle, means bread at its best without the addition of baking agents or enzymes, bread that consists only of traditional ingredients: flour, yeast, and salt.

When ARTiBack began on the expansive, still vacant area of the Star Park in Halle in 2016, the three founders had a common vision: everyone should have the opportunity to eat baked goods that meet the high quality standards of a traditional baker.

The mission: To provide bakery products with ample time and care, to develop the best of the ingredients, and to make them accessible to all consumers as fresh as possible. This concept hits the zeitgeist perfectly and what began with little more than a handful of employees is now a growing company that currently employs approximately 150 people. ARTiBack has successfully established itself in the field of frozen baked goods for the retail food industry and supplies freshly baked breads and rolls not only within Germany, but also to Switzerland, the Netherlands, and Italy.

Tasty, fresh, wholesome, and healthy...

...these are the attributes of quality bread according to ARTiBack's company philosophy. The secret? Just like in the good old days, a lot of bread here is made with sourdough, and this requires a long rest period to rise before it is ready to go into the oven. "The long proof time ensures that each ingredient develops its full potential", explains CEO Axel Sehnert. The young company has already received public recognition for its work, having secured a place among the three finalists in the

"Culinary Saxony-Anhalt 2022" competition with its rustic twisted bread.

Surprisingly, production of this healthy and tasty bread takes place on an industrial scale. In the new, state-of-the-art production hall, up to 6,000 larger loaves or 36,000 rolls are baked per hour in each of the two stone oven lines, depending on the size of the baked product, and are then safely packaged and prepared for shipping. The wonderful smell of fresh dough fills the air in this facility, where innovative technologies and highly advanced production equipment are at work, to enable creation of the company's host of healthy baked goods.

Employee wellbeing is also of top priority here. Compressed air plays a key role in aiding ergonomic flow for numerous work processes, and also powers the pneumatic cylinders when lifting and lowering the packed shipping boxes. Pneumatic cylinders and pneumatically controlled valves can be found throughout the production process and are even used to spray the dough with cooking oil before it is rolled out to prevent it from sticking.

Compressed air, but oil-free please

Just like in most production facilities, compressed air is also essential in industrial bakeries. As food is produced here, the compressed air must be especially pure and free of contaminants. The first variable-speed, two-stage dry-running CSG-90 T SFC W rotary screw compressor from KAESER was acquired right at the start of operations in 2017. With the second stage of expansion in 2020, and the addition of

*Just like in the good old days,
a lot of bread here is made with
sourdough.*

quality and freshness

ARTiBack bread contains no artificial baking agents.

the second stone oven production line, it was time for another oil-free rotary screw compressor, a KAESER CSG 55 T W. Both systems are currently controlled by the SIGMA AIR MANAGER 4.0, which ensures that the most energy-efficient variant of the two rotary screw compressors is always used and that the compressed air supply

endly technology were also met, price savings of approximately 30 percent of the investment costs could be claimed. For even greater cost efficiency, the heat recovery integrated into the compressor system makes it possible to use the exhaust heat from the compressors for heating purposes.

ARTiBack has no worries when it comes to reliable compressed air availability for either of the stone oven baking lines. Furthermore, because the system communicates directly with KAESER's headquarters in Coburg, all processes are continuously monitored for optimum performance. As Axel Sehnert contentedly summarizes: "The compressor systems are so reliable. However, if a fault were to occur, we are safe in the knowledge that we would receive rapid assistance and that the fault would be fixed without delay."

The full service contract ensures us 100 percent compressed air availability.

(Axel Sehnert, CEO)

can be operated as energy- and cost-efficiently as possible. Since the requirements for BAFA funding for environmentally fri-

This highly advanced compressed air system is rounded off by a full service contract, which means that



Delicious and healthy baked goods are produced in the two stone oven baking lines.



The SIGMA AIR MANAGER 4.0 ensures energy-efficient control at all times.

Exceptional cost transparency with 'Contracting'

Smart, safe, worry-free

Integrated into furniture of all types, Hettich products are often invisible, but indispensable. Whenever we open a cabinet door, pull out a drawer or move furniture elements in some other way, Hettich fixtures may be behind this movement and provide convenient, reliable functionality in millions of pieces of furniture.

The Hettich Group is one of the world's leading manufacturers of furniture fittings. The company's headquarters are located in the town of Kirchlegern in the eastern region of North Rhine-Westphalia, Germany. In 2021, Hettich employed 7,400 people worldwide, of whom more than 3,700 are based in Germany. The company is represented in 24 countries by its own subsidiary companies and is 100% family-owned.

Hettich can look back on more than 125 years of successful company history. Its story is characterized by outstanding engineering achievements and bold entrepreneurship. The East Westphalia-Lippe region has been home to the company since 1930 and lies at the heart of the German furniture industry. Today, one can find Hettich's intelligent, innovative furniture fittings not only in Germany, but throughout the world, where they significantly influence the quality and functionality of the furniture.

The production processes for these high-quality furniture fittings are strictly defined and regulated according to effective quality management processes. The entire workflow takes place on long production lines, where the machines – some of which are from the in-house mechanical engineering department – perform their work. Here, the raw material is rolled and stamped, and numerous individual components are subsequently assembled. There are many of these production lines, as many as there are final products, since the fittings are manufactured to meet the exact needs of the furniture industry. As one would imagine, the components need to be lifted, rotated, lowered, and moved through all of the production centers with the help of pneumatic valves and cylinders. Therefore, compressed air is essential for Hettich's varied handling requirements.

Image below: Robot movement is controlled with compressed air.

Image center: Machines from the in-house mechanical engineering department are also used here.



Sustainability and energy efficiency

Before modernizing the compressed air system, compressed air was provided by older, third-party compressors, which could only be manually controlled. This method was anything but energy-efficient. Long before the current system was commissioned, Uwe Ortmann, Facility Manager at Hettich, was looking for ways to optimize the system: "After participating in a KAESER compressed air seminar several years ago, I went home with an important suggestion for improvement, namely the knowledge that you can save a lot of energy and money with a master control system." This realization would lead the company to achieve significant cost savings. The first 'Contracting' agreement with KAESER

e

was signed in 2002. However, the company saw continued growth, new buildings were added, the production area was repeatedly expanded, and accordingly, the compressed air system also needed to provide increased capacity. In 2018, the second 'Contracting' agreement was signed. With this project, Hettich not only wanted to focus on maximum compressed air availability and reliability, but also on sustainability and energy cost optimization. Ortmann recalls: "We were already more than satisfied with the KAESER compressors, but the new Premium Efficiency IE4 drive motors were a quantum leap in terms of energy efficiency." So, once again, products from KAESER would be used, but where would the new, even larger compressed air station be housed? Due to lack of available space in the facilities, the decision was made to build a separate compressed air building on



Hettich's furniture fittings are used in furniture throughout the world.

All-inclusive package

When deciding to choose the SIGMA AIR UTILITY model, Hettich also opted for the all-inclusive package. This reliable custom

You can save a lot of money with a master control system.

(Uwe Ortmann, Facility Manager)

the company's site, in which a total of seven KAESER rotary screw compressors (four FSD 575, one DSDX 305 and two DSD 175) and six compressed air dryers (TI 901) are now safely and securely housed. The SIGMA AIR MANAGER 4.0 ensures perfect interplay between all components and further optimizes energy efficiency. Under its control, compressed air is conveyed at a flow rate of 7,000 cfm at an average pressure level of 93 psi. Thanks to the half a mile long underground ring line, all 11 production halls are supplied with the necessary compressed air.

compressed air supply ensures exceptional cost transparency. Instead of investing in a complete compressed air system, the company pays only for the compressed air that it actually requires, leaving capital assets available for other investments. The powerful combination of KAESER's Teleservice capability, the logistics center and dense global service network, which keeps a constant eye on the compressed air station and can intervene immediately as needed, assures maximum compressed air availability. "After electricity, compressed air is the most important source of energy for production, which is why we can't afford even a minute of downtime. We are very satisfied with the reliability of the compressed air supply and the professionalism of the KAESER Service team."

Compressed air plays a key role in every aspect of production.



At long last – a stable air supply for the aeration tank

Weathering any s

Following its primary objective of water protection, Abwasser, Grün und Lüneburger Service GmbH (AGL) has been increasingly focused on achieving climate neutrality as the main task of its wastewater treatment operations. Within this context, the “Optimization of aeration system and compressed air generation” project was created. For the latter, the operator wanted a solution that generates stable air in the event of weather fluctuations and that can be easily controlled. The use of four HBS rotary screw blowers successfully delivered the desired results, together with significant energy cost savings.

When taking a tour of the wastewater treatment plant, an illuminated panel catches the eye: electricity and heat are generated at the plant’s own combined heat and power plant. Accurate to the minute, the panel displays the current values, in large red digits, of the energy produced from the wastewater sludge. Due to co-fermentation, the energy yield is very high, since this sludge also contains fats resulting from fat separation of local restaurants and households in Lüneburg. The heat is mostly used to heat the wastewater sludge, while a smaller portion is used to heat the plant’s operations facilities. However, the situation is even more interesting when it comes to electricity generation: the combined heat and power plant generates approximately six thousand megawatts of electricity per year. The plant’s own consumption is significantly lower, at up to five thousand megawatts, so currently approximately one thousand megawatts are fed into the local power grid. Yet, there are more plans in store for the electricity generated here, with the goal of expanding electric mobility at the site.

Time for improvement

Within the framework of the climate protection project, the entire aeration process, including control valves and compressed air generation, was renewed and optimized. Before modernizing the system, the air for the aeration tank was generated by four older 70 hp turbo compressors. In certain circumstances, such as under the influence of low-pressure atmospheric conditions or thunderstorms, these systems were often sensitive and prone to malfunction. The operator sought a solution that would control air generation more directly, dynamically, and over a broader range, and which would achieve more consistent air intake performance regardless of extreme weather conditions. Furthermore, the energy consumption of the 25-year-old turbo compressors was no longer efficient. The modernization project began in earnest with comprehensive planning and subsequent public tender. Around that time, the IFAT trade fair was taking place in Munich. Master Electrician Christian Willenbockel recalls: “To ge-



The illuminated panel shows the current values of the energy produced from the wastewater sludge.



form

To ensure success of the entire concept, all components had to be thoughtfully constructed and arranged.

(Jörg Schwanke, Laboratory Manager)

nerally inform ourselves regarding the technical possibilities, we had visited the KAESER stand at IFAT 2018 in Munich and saw an HBS rotary screw blower with controller. We weren't yet sure if newer-generation turbo blowers, or modern rotary screw blowers would be the right solution to meet our needs. When we heard that KAESER was looking for companies to test out their new rotary screw blowers, we jumped at the opportunity to find out." The KAESER system was commissioned in February 2019 and would demonstrate during a one-year test phase whether it was the right choice for the Lüneburg wastewater treatment plant's requirements. The software for the master control technology was even reprogrammed and adapted to make this possible. The result was more than satisfactory, as the measured and documented values clearly showed. Christian Willenbockel happily explains, "The new rotary screw blower has precisely maintained the desired process values even in extreme weather conditions." Over the course of the formal procurement process, it was determined that rotary screw blowers were best suited to fulfil the Lüneburg wastewater treatment plant's requirements and that they provided the most economical solution. In 2020 the decision was made to switch the entire system over to rotary screw blowers from

KAESER. Since then, two HBS 1600 M SFC (160 kW) and two HBS 1600 M SFC (200 kW) with frequency drive and Super Premium Efficiency motors have been responsible for aeration of the aeration tank. The decision was also made to choose the SIGMA AIR MANAGER master controller, as additional tests have shown it provides even better system controllability.

Objective achieved

In addition to improved process control, significant energy savings were also verified. "The considerable cost savings that we have been able to record since the switchover are attributed to several factors: the impressive energy efficiency of the new blower systems, the decision to use a master controller and the reduction in system pressure from 10.3 psi to 9.8 psi, which we were able to achieve as a result of modernizing the aeration system," explains Jörg Schwanke, Laboratory Manager. Ultimately, the sum of all measures resulted in savings of approximately 500 megawatts per year, making this capacity available for other consumers, such as for the expansion of on-site electric mobility.

A bird's eye view of the Lüneburg wastewater treatment plant.



The four HBS rotary screw blowers from KAESER.



Satisfying the needs of today without jeopardizing the opportunities of future generations. That's the order of the day and how the Italian yeast specialist AB Mauri views sustainable development – the goal is to create synergies between economic, ecological, and social sustainability. In line with this company philosophy, they embarked on a comprehensive energy savings project and completely modernized their blower system.

AB Mauri is part of the Associated British Foods plc (ABF) international group based in London and is a leading global manufacturer of yeast and ingredients for bakeries, patisseries and pizzerias, with over 7,000 employees and 52 locations in 32 countries. In Italy, AB Mauri operates two plants, one in Cologna (province of Brescia) and the other in Casteggio (province of Pavia), employing a total of approximately 250 people.

Sustainability and energy savings were the main goals of the complex optimization process recently implemented at the Casteggio location. Accordingly, the yeast aeration process was also closely examined. Thanks to the excellent cooperation and partnership that developed between KAESER and AB Mauri's engineering team, a finely tuned technical solution was found, with which the yeast specialist is highly satisfied.

Sustainability and energy savings

Here at the Casteggio location, near the northern Italian city of Pavia, everything revolves around the production of yeast, which is created by the growth of yeast cultures in a primarily molasses-based solution. The molasses contains not only sugar but also nutrients such as vitamins and trace elements, which, together with water, form the ideal nutrient medium for yeast cultures. An important prerequisite for the yeast cells to multiply adding oxygen to the



Sustainable in the food

nutrient solution. This delicate biological process, critical to yeast production, lies at the heart of production, enabling the use of modern technology to significantly increase efficiency potential.

As a rule, fermentation processes in foodstuffs are based on precise process air profiles. The need for oxygen is based on the growth of microorganisms, i.e. as the volume gradually increases, more oxygen is required. Blower air demand varies during precisely defined phases within the process, which can take several hours. The key word here is 'control'. Moreover, the quality of the blower air plays an important

role, as it is directly introduced into the production process.

Precision control

After considering and analyzing all data and process air requirements, a total of 19 KAESER Pillaerator turbo blowers were selected in two versions, the LP8000 (200 hp) and the LP14000 (400 hp). Thanks to the turbo blowers' infinite speed control, flow rate can be variably adjusted to meet actual demand at any time. This not only enables straightforward process control, but also reliably prevents potential energy losses due to over-aerati-

reduces energy costs

nability ood sector

The future-oriented technology, system design, process optimisation and after-sales service support convinced us of KAESER.

(Ing. Alberto Alice, EMEA Head of Capital Projects)

ensure smooth interaction of the 19 turbo blowers, a total of seven master controllers from KAESER and six routers were installed. Additionally, the maintenance-free drive ensures even greater cost efficiency: since the contact- and lubricant-free magnetic bearing motor operates completely wear-free, there is no need for oil and bearing changes, and maintenance is limited to simple air filter changes.

Complete satisfaction

Installation, connection, and commissioning of the new blower station were highly complex due to its size. Despite this, everything went smoothly thanks to professional planning from all parties involved, and, most importantly, this was achieved without any unwanted production downtime. The close collaboration between KAESER and AB Mauri's engineering team made it possible to identify the most efficient solution in terms of plant layout, energy consumption and the most powerful machine combination. The overall result has helped save more than 15 percent of the entire plant's electricity consumption.

on. On-board sensors continuously monitor key operating parameters such as flow rate, pressure, speed, and temperature and

interact with the master controller and in-house control center to enable implementation of precise adjustments as needed. To

Image left: The SIGMA AIR MANAGER 4.0 communicates with the in-house management system for demand-oriented, pinpoint adjustment.

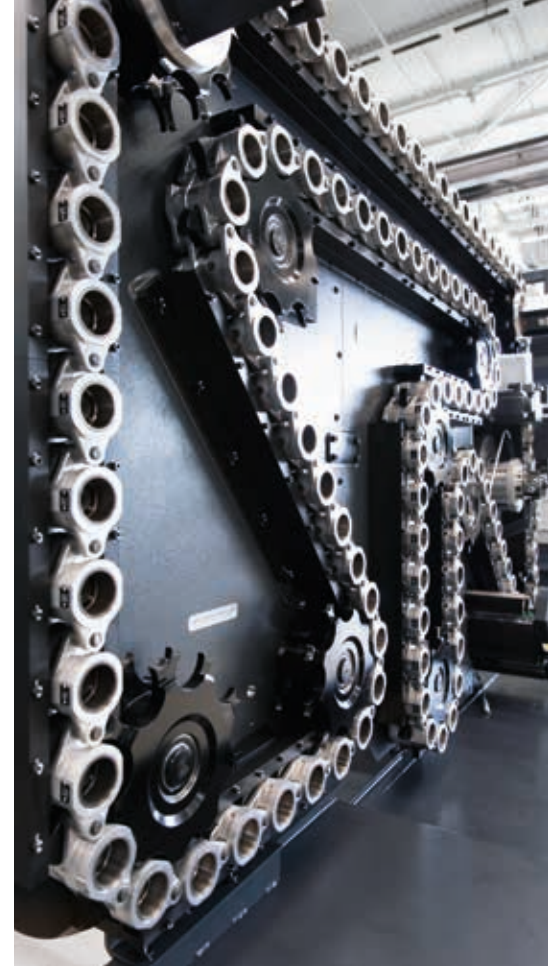
Image right: The "Hall of Fame" with 19 KAESER PIIIerator turbo blowers.



Photo: Adobe Stock



Visitors to the DMG MORI showroom can take in the impressive variety of possibilities in an elegant atmosphere.



DMG MORI products are delivered worldwide.

Expert advice makes all the difference

Simulation and reality

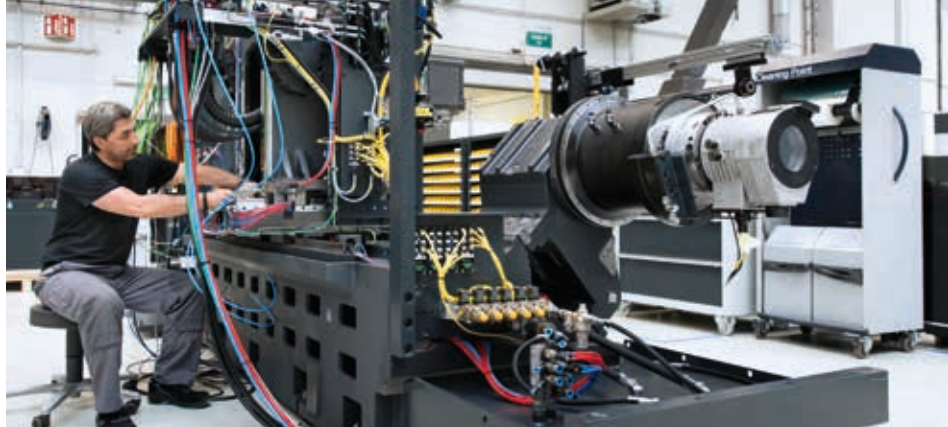
Global value chains begin with high-precision machine tools and sustainable technologies from DMG MORI. Integrated automation and end-to-end digitalization solutions expand the core business with turning and milling machines, advanced technologies, and additive manufacturing.

DMG MORI AKTIENGESELLSCHAFT is a leading worldwide manufacturer of machine tools with sales revenues of over € 2.0 billion and more than 6,800 employees. In the “Global One Company”, around 12,000 employees are in direct contact with over 100,000 customers from 55 industries. DMG MORI is present in 87 countries – with 15 production plants, 111 sales and service locations – and is actively advancing the future fields of automation, digitalization, and sustainability.

DMG MORI consolidates technology excellence in the leading industries of aerospace, automotive, die & mould, medical, and semiconductor. With the DMG MORI Qualified Products (DMQP) partner program, perfectly matched peripheral products are offered from a single source. Customer-oriented services accompany the entire life cycle of a machine tool – including training, repair, maintenance, and spare parts service. All service processes are electronic with the “my DMG MORI” online customer portal, which enables direct access to service experts. DMG MORI takes a global and holistic approach to sustainability. Both the “Company Carbon Footprint” and the “Product Carbon Footprint” are carbon neutral – and this applies throughout the entire supply chain to the customer.

Counteracting rising energy prices

The company is addressing the issue of rising energy prices by using the very latest compressed air technology. The success of a technology leader such as DMG MORI is as dependent on the competitiveness of its products as it is on the efficiency of its production processes and equipment; compressed air technology is no exception. Compressed air is required throughout production as sealing air (used to seal a cavity with the help of air or gas overpressure) to prevent dirt or moisture contamination in the measurement systems and spindles. Furthermore, compressed air is needed to power pneumatic cylinders for opening and closing doors and for “air showers” to blow off workpieces during tool changes. The grippers on the robot equipment would also not function without compressed air. Compressed air is essential in every stage of production at DMG MORI. Even before the energy crisis, it was clear that large-scale modernization of the compressed air station was necessary. Gerd Kleinegrauthoff, Maintenance Workshop Manager at the



A machine tool manufactured to customer specifications receives its final touches.

ted and the corresponding simulations were presented. One of these turned out to be the perfect solution for us.” The advanced compressed air system, calculated according to the latest compressed air technology findings, includes two speed-controlled KAESER DSD 145 rotary screw compressors (max. pressure 110 psi, max. flow rate 14 m³/min) with energy-saving Super Premium Efficiency drive motors. Two energy-saving SECOTEC TF 280 refrigerated dryers take care of compressed air treatment, while the SIGMA AIR MANAGER 4.0 master controller ensures best possible

by roughly 1%. . With this in mind, KAESER performed various tests following commissioning to determine the optimal pressure value that was high enough to sufficiently cover total demand, yet which was able to keep the cost level as low as possible. The goal of optimized cost efficiency for the new system has been fully achieved. When asked if reliability and redundancy, the two other key points on the wish list, have also been met, Maik Jagiello enthusiastically responded: “The system has been running smoothly and reliably since 2021. Together with the full service contract from KAESER, we are safe in the knowledge that we have everything covered.”

KAESER qualified right from the outset through the professionalism of the entire project management process.

(Maik Jagiello, Head of Corporate Real Estate Management)

Bielefeld site, summarized the initial situation: “The old systems were unreliable, we had frequent fault messages and there was significant potential for improvement in terms of energy consumption.” As early as 2020, the search for a suitable supplier began. The company’s top priorities for the new system were reliability, redundancy and, most importantly, energy efficiency. Quotes were subsequently obtained from several providers. Maik Jagiello, Head of Corporate Real Estate Management, explained: “What we were looking for was a comprehensive concept, but most providers only came up with a 1:1 replacement solution for our existing system. KAESER qualified right from the outset through the professionalism of the entire project management process. KAESER has intensively dealt with the question of what the best solution for DMG MORI is. Following an extensive compressed air demand analysis, a total of seven different configurations were calcula-

interaction between all components and saves even more energy. But that’s not all – as we know, for every two psi reduction in operating pressure will reduce energy costs

The KAESER compressed air system includes everything that modern technology has to offer in terms of energy efficiency.



Surface treatment with compressed air

A total blast



As an expert partner in premium surface finishing, Mayer & Zick GmbH, located in the Allgäu region of Germany, offers its customers all the necessary technical requirements and professional skills to meet their specific needs. Whether corundum blasting, cast iron blasting, sweep blasting, or spray galvanizing – the Allgäu surface specialist's blasting cubicles are perfectly proportioned to accommodate workpieces of all sizes, .

At Mayer & Zick GmbH in Memmingerberg, everything revolves around the high-quality finishing of surfaces. The company uses a host of versatile surface-finishing technologies and innovative, environmentally friendly application methods. Customers can expect excellent service and a smooth experience throughout the entire process. From fire protection coating to arc galvanizing, from dust blasting to cast iron blasting, from industrial coatings to metal finishing – Mayer & Zick GmbH specifically focuses on premium quality in all areas relating to sand

blasting and surface technology – and as a result draws on the strengths of the company with a consistency that is unique in the industry.

Putting on the pressure

Organic and inorganic contaminants on surfaces are the most common cause of damage if they are not professionally removed prior to further treatment. Sandblasting refers to the treatment of a surface, material, or workpiece using a solid blasting medium to remove rust, dirt, paint, soot, and



Mayer & Zick GmbH uses a host of innovative surface finishing technologies.



The portfolio also includes high-quality industrial coatings.



Vogelgsang, "All of our treatment processes would come to a complete standstill if we experienced even the briefest interruption to the compressed air supply." Unfortunately, such interruptions were commonplace before the switch to KAESER systems and the SIGMA AIR UTILITY operator model. "The old systems were prone to malfunction. We were always having to deal with them to get things up and running again," relates Martin Vogelgsang. "Since modernizing the system and the switch to the compressed air operator model, we finally have a stress-free solution and no longer have anything to worry about in that regard."

Always enough air

The pressure required for the surface treatment processes is between 115 to 145 psi.. The flow rate per minute varies depending on the demand of the respective consumer and therefore lies between 425 to 700 cfm.. The SIGMA AIR MANAGER 4.0 master controller ensures precise performance adjustment to meet current demand and is responsible for providing the correct mix of start and stop cycles. It achieves this by calculating a variety of options in advance and then selects the most energy-efficient one option to adapt

the compressors' flow rate and energy consumption to suit current compressed air demand. A total of five KAESER rotary screw compressors, including two CSD 105 and three CSDX 165 units with Super Premium Efficiency motors, also ensure maximum energy efficiency, while four energy-saving TF 203 refrigerated dryers, various filters and an oil separator provide high-quality compressed air treatment. The systems are all designed with maximum energy efficiency in mind, but there is more when it comes to energy savings. As the compressors are equipped with internal plate-type heat exchangers, the exhaust heat generated during compression is used for heating purposes. Since unrestricted compressed air supply reliability is a basic prerequisite for smooth operation of the various machining processes at Mayer & Zick GmbH, the company's management decided in favor of the SIGMA AIR UTILITY operator model from KAESER when modernizing the compressed air system. "With regards to compressed air, we prefer to have this area completely taken care of by specialists," says Martin Vogelgsang. "The KAESER service team looks after system maintenance and service independently, which ensures a dependable and uninterrupted compressed

other contaminants to create a clean surface. This process is performed using compressed air. With its help, a strong air jet is generated which takes the blasting medium (e.g. sand, but also blast furnace slag, glass granules, corundum, steel, plastic granules, etc.) from a collection container and accelerates it. When this strikes the surface to be treated at high speed together with the air jet, unwanted components, such as rust or paint, are detached and carried away. "Compressed air is the most important asset in our company," explains CEO Martin

The compressed air station from KAESER is the safest and most reliable solution on the market.

(Martin Vogelgsang, CEO)



The processed workpieces vary greatly in size and shape.



With the operator model, the customer saves on investment costs and pays only for the compressed air.

air supply." A further advantage for Martin Vogelgsang is the monthly compressed air bill. This makes financial planning much easier, as capital is not tied up in the compressed air system and is therefore available for other key company investments.

Canadian company benefits from six-figure operating cost savings

Cost efficiency in focus



*Image left: The new compressed air station is a technical and visual highlight.
Image right: SIGMA CONTROL 2 efficiency center.*

A Canadian metal packaging specialist produces all types of beverage and food cans, metal closures, and special packaging. Following renovation and update of the factory, in which the production focus was completely pivoted to beverage cans, the time had come for comprehensive modernization of the compressed air system.

Having produced a wide variety of coated steel tins for beverages and canned goods, this Canadian specialty manufacturer needed to shift its focus to a new line of aluminum cans. The timing of the product change also marked the starting point for an efficiency evaluation of the old compressed

air system. A compressed air audit showed that it was oversized, with a total power output of almost 1950 hp (for six frequency-controlled, water-cooled systems with various power outputs), which resulted in unnecessarily high consumption costs and was also exceptionally repair- and main-

tenance-intensive. The chosen compressed air treatment concept (compressed air quality class 1:4:1 as per the ISO standard for foodstuffs) included four undersized refrigerated dryers, two older coalescence filters and 25 additional filters at the compressed air take-off points. It offered plenty of room for improvement.



Thanks to the integrated web server, it is possible to display operating data, maintenance and fault messages on a PC.

Improved efficiency – lower costs

The goal was to significantly reduce costs at every level: lower operating costs, reduce repair and maintenance costs, lower heating costs through the use of heat recovery and a new compressed air treatment concept. Equipped with this wish list, KAESER COMPRESSORS Canada, together with the local KAESER partner, set to work. The first of the comprehensive improvement measures was to detect and eliminate various leaks in the compressed air network. Just this measure alone enabled

compressed air demand to be reduced by a full 1000 m³/h.

With this new consumption value, it was then time to correctly dimension the individual components of the new station, which today consists of three air-cooled KAESER ESD 250 and ESD 300 rotary

Correct dimensioning of the new compressed air station has enabled huge cost savings.



All images: Air Solutions Canada

screw compressors. Featuring flow-optimized SIGMA profile airends and energy-saving IE4 motors, the compressors ensure highly efficient compressed air demand coverage and also provide sufficient redundancy in the event of maintenance or repairs. These machines are complemented by four new KAESER SECOTEC refrigerated dryers that easily cope with the high ambient temperatures and humidity typical of summer weather in Ontario and reliably maintain the pressure dew point of 37°F, while new high-efficiency coalescence filters help ensure compliance with food sector compressed air quality class requirements.

Plus, the advanced SIGMA AIR MANAGER 4.0 master controller helps achieve even greater cost efficiency. It is the heart of a modern compressed air system and key technology for the use of 'Industrie 4.0' services, such as remote monitoring (SIGMA SMART AIR). Providing core intelligence, it efficiently controls the individual machines and perfectly matches delivery performance to accommodate actual compressed air demand. The controller analyzes operating data in seconds, simulates alternative actions, and

selects the one that is most efficient. This results in exceptional energy efficiency, and provides significant cost savings.

The cost reduction project is rounded off by recovering the heat generated during compression, which is made possible via the plate-type heat exchangers integrated into the compressors. In the summer, the unwanted heat is ejected from the building, but in the winter it is used to heat the adjacent production areas – a textbook 'best practice' installation.

Overall, the company was able to reduce its energy consumption by over 1 million KWh per year through eliminating leaks in the compressed air network and the significantly improved energy efficiency of the new compressed air system. The 5-year warranty from KAESER provides additional peace of mind for cost control. Thanks to the extensive system update, the company is now prepared for the future with high compressed air supply costs a thing of the past.



Photo: Adobe Stock

Custom-made compressed air system

A promise is a promise



Rikus ten Brücke (Sales Support KAESER) and Dennis van Helden at the SIGMA AIR MANAGER.

A custom-made compressed air system, specifically tailored for the specific application? That may be unusual for some, but is business as usual for KAESER. The technical and economic performance of a new compressed air system has to be clearly designed and calculated in the proposal phase of the project, to ensure it will precisely meet all expectations in practice. What this ultimately looks like can be seen at the Dutch company Wuppermann Staal Nederland B.V. in Moerdijk.

The Wuppermann name has been synonymous with premium quality in the field of specialty steel processing and finishing for 150 years. Since it was founded in 1872, the family business, which originated in Germany, has become the innovation leader in corrosion protection. The product portfolio includes flat products, piping and piping components made of steel. More than 800 employees work at the five Wuppermann Group production sites in the Netherlands, Hungary, Austria and Poland.

With 150 employees, Wuppermann Staal Nederland B.V. in Moerdijk (NL) is the largest producer of galvanized flat steel (wide strip and slit strip) within the international Wuppermann Group.

“Our compressed air demand is relatively high,” explains Dennis van Helden (Head of Mechanical Maintenance). “The compressed air is used to distribute the zinc layer evenly over the steel. Since we don’t want to contaminate the material that’s being galvanized nor the applied zinc layer, we

Dennis va



also have high requirements in terms of compressed air purity – purity class 1.2.1 as per ISO 8573-1:2010, in fact. That's why we installed sophisticated compressed air treatment downstream of the compressors to keep moisture, oil and any other contamination away from our process."

Reliability to count on

The old single compressor that had been in use had reached the end of its useful life and urgent replacement was necessary. Since the company was looking for the best and most efficient solution, proposals were obtained from several potential suppliers. "Some of them were unable to meet our technical requirements. In the end, only two candidates remained. We tested and evaluated the proposals in terms of investment, operation and maintenance costs and reliability from a 10-year perspective, and KAESER came out on top," recalls Dennis van Helden. The KAESER setup includes four stationary DSD 240 rotary screw compressors, two HYBRITEC combination dryers (flow rate 3000 cfm), various filters, a 2600 gallon buffer tank and the SIGMA AIR MANAGER 4.0 master controller. Given the relatively constant compressed air demand at the plant, the choice of four full load/idle stationary compressors proved to be the most reliable



Wuppermann Staal Nederland B.V. in Moerdijk is the largest producer of galvanized flat steel within the international Wuppermann Group and employees 150 people.

The integrated plate-type heat exchangers allow the exhaust heat generated during compression to be recovered and reused.

(Karsten Pronk, Managing Director)

van Helden next to the energy-saving HYBRITEC dryer.



and economical solution. The SIGMA AIR MANAGER 4.0 monitors the entire system and selects which compressors to operate based on operating hours using a specific switching algorithm. Two compressors always have the respective demand covered and a third one can be added as needed. This setup also ensures the necessary redundancy. "Unplanned production downtime would be extremely costly, also on account of process continuity," says Managing Director Karsten Pronk. "Nobody wants that, and we also wanted to avoid production interruptions, insofar as possible, during installation of the new compressed air system, for which the old compressor first had to be dismantled. KAESER came up with the idea of setting up a temporary emergency installation so that the compressed air supply could continue as usual during the conversion and reassembly process. Once the new compressed air system was installed and ready to go, we carried out the changeover during a period of planned downtime," praises Karsten Pronk.

Promise kept

Equipped with Super Premium Efficiency motors, the new compressors are exceptionally energy-efficient. Further cost savings are made possible thanks to the integrated plate-type heat exchangers, which allow the exhaust heat generated during compression to be recovered and reused. Thanks to the full service contract, a reliable supply of quality compressed air is guaranteed at all times and there are no additional costs for maintenance and repair work.

Karsten Pronk happily summarises: "Communication with KAESER was very smooth and very open, which worked exceptionally well and prevented misunderstandings. What is even more important for us is that they kept their promise, which gave us a feeling of complete confidence and trust for the future."

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