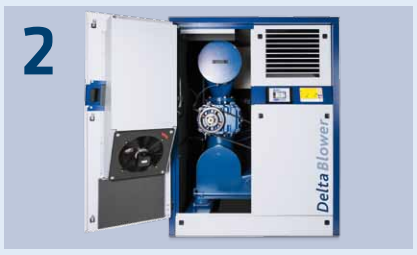
CUSTOMER JOURNAL · EDITION 2·2017

AERZEN COM·PRESS

Positive displacement blower
AERZEN Delta Blower G5plus sets the standard



Wastewater treatment plant
Emsbüren: In the aeration tank, the turbo provides ventilation

Aerzen Systems
Customised compressed-air solutions

Dear Readers,

Sebastian Meißler, Marketing

Energy efficiency in process engineering is still a central topic. Depending on whether it concerns conveying, drying or ventilating, – a considerable proportion of the energy costs of plants involved in process engineering relate to the broad field of application of blowers and compressors. All the more need then for energy-saving concepts, in order to meet the current requirements of the industry. Moreover, investments in energy efficiency measures usually have a high return on investments and, consequently, payback is quickly achieved. For small and medium-sized enterprises in particular, an investment in energy-saving provides a clear competitive advantage.
In line with this topic, this edition gives you a small insight into the world of lime burning. Together with plant manufacturer QualiCal, AERZEN has supplied the new firing technology for the limestone producer KöhlerKalk in Northern Hesse. The new plant clearly shows, how economic advantages, sustainability and increasing product quality can be achieved. As usual, other interesting news, tips and contributions from all over the world are waiting for you.

Please enjoy reading this issue!

Kind regards,

At KöhlerKalk in Hesse a machine park consisting of Delta Hybrid and Delta Blower provides the process air.

Investment in a successful future: Christian Köhler relies on the latest firing technology.

Small lime works with big technology

KöhlerKalk invests in a new kiln: QualiCal and AERZEN supply technology with maximum energy efficiency

Recently, KöhlerKalk in Northern Hesse commissioned a new kiln. Thanks to the rotary lobe compressors made by AERZEN, the plant manufactured by QualiCal counts among the most efficient solutions in its field.

In Northern Hesse, they are calcining dolomite, a crystalline mineral mixture consisting of calcium carbonate and magnesium carbonate. This burnt lime is particularly suitable for the steel industry, as the magnesium in the dolomite, as an oxide (MgO), has a positive effect in steel production and protects the converter walls when refining raw iron into steel. The general task of the added lime is to bind the sulphur in the melt. Therefore, steelworks are among the regular customers of KöhlerKalk, located in Vockerode, Hesse, east of Kassel. “There are not many dolomite deposits in Germany,” reports Christian Köhler, technical manager of the smallest lime works in Germany.

In view of the future security of the location in the Werra-Meissner district, the family-owned company decided to invest in a new kiln in 2017. The QualiCal specialists from Italy received the order. Designed as a parallel flow regenerative kiln (GGR kiln) this type is among the most energy-efficient lime burners according to BAT (best available technology, component of the installation authorisation law according to EU Directive 2010/75/EU concerning industrial emissions). While in the past, for KöhlerKalk, the consumption of coke had been the biggest factor in their operating costs, this has now shifted to their pulverised lignite and electrical energy costs. “Hitherto, electricity was never an issue,” reflects Köhler. “The old kiln was working almost mechanically.” When the new plant has been run-in, the fuel will no longer be brought into the kiln together with the dolomite rock in layers and set on fire, but instead blown directly into the calcination zones with distributed burner lances. For this, blowers for transport and cooling air are as necessary as they are for generating process air in GGR kilns.

Hybrid blower solution reduces energy consumption

The targeted blowing in of lignite with a total of 24 burner lances - equally distributed between the two shafts - improves the thermal efficiency as the carbon directly releases its energy onto the rocks. The calcination is accompanied by a sophisticated airflow - the parallel flow regeneration. At KöhlerKalk, rotary lobe compressors of the AERZEN Delta Hybrid series assume this function. Hybrid blowers combine two procedures for conveying air in one machine: the Roots principle as isochoric compression for low pressures and the screw compressor principle with internal compression for higher pressures. As far as the concept is concerned, the Delta Hybrid is based on the well-known and successful AERZEN series Delta Blower and Delta Screw. AERZEN has calculated

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With AERaudit, AERZEN screens operating data from blower stations in wastewater treatment plants.

Discovering potential and creating transparency

Load operation in wastewater treatment plants is subject to wide variation. The amount of waste water to be treated – and its level of pollution – will change depending on region, time of day, day of the week, season, or amount of rainfall – often without warning. With the new AERaudit service, AERZEN measures the air volume requirements of a wastewater treatment plant and shows the individual saving potential.

Equipped with a mobile measuring case which includes sensor technology, energy counter and data logger, the AERZEN service team screens the blower station. On site, i.e. at the wastewater treatment plant, all necessary operating data (volume flow, system pressure, temperature, kW-rating) is measured and recorded live for a defined period.

The recorded data is then assessed in detail at the offices of AERZEN's parent company. No weak load or peak load remains undocumented. On this basis, the AERZEN team develops one or more possible solutions customised to the individual plant. The objective is clear: to provide utmost energy efficiency.

Customers are provided with a transparent and comprehensive presentation of the load profiles and energy consumption of the blower station. In addition, AERZEN documents an individual solution involving the various machine technologies of the Performance^3 portfolio (Blower, Hybrid, Turbo). AERZEN illustrates the potential for saving energy and CO_2 in the plant, and the payback periods that can be achieved.

Data collection on site

Safety standards for the pneumatic industry: new brochure

A unique selling point of AERZEN products is that our silencers are free of absorption material. Thus, this feature has been included in the leaflet portfolio. The new brochure Safety Standards (A3-121-00) provides information about oil-free operation of AERZEN assemblies, as well as about the increased energy efficiency and lifetime extension of process air systems thanks to AERZEN reactive silencers without absorbent material. Please have a look at this new brochure.

You will find further information at:
www.aerzen.com

that the rotary lobe compressor requires 15% less current than existing blowers concerning absolutely oil-free conveying of air.

At KöhlerKalk, the economical use of electrical energy has a significant effect on the efficiency of the entire production - and this with short ROI-periods. The importance of the blower technology in modern GGR kilns becomes clear when you look into the machine room of the new kiln. For the combustion air, three Delta Hybrids D 75 L (max. 132 kW, 4,000 m^3/h, 1,000 mbar) are in operation. Another two packages with the same capacity convey cold outside air, blown in from the bottom into the calcined lime, to cool it down to a considerably lower temperature before discharging it. For cooling the burner lances in the two furnace towers and the pneumatic conveying of the pulverised lignite, KöhlerKalk will in future rely on the AERZEN Delta Blower series. As the (in total) three packages type GM 25 S (55 kW, max. 1,450 m^3/h) provide considerably less capacity than the five Delta Hybrid blowers, KöhlerKalk decided not to have an upgrade here. "Our goal was to achieve maximum efficiency gains with any increase in the plant's costs kept as low as possible," says Köhler.

"In kilns, positive displacement blowers are traditionally used without exception. These are working very reliably, but consume quite a lot of energy," explains

Partnership in engineering, international co-operation concerning commissioning: Edoardo Cella from QualiCal, Italy, and Arkadiusz Mrozek from Aerzen Polska

The pulverised lignite is blown through burner lances into the kiln by AERZEN Delta Blowers.

Francesco Cella, CTO at QualiCal. With the change to rotary lobe compressors, the plant manufacturer succeeded in making available the necessary air volumes as energy efficiently as possible in synergy with an exact speed control of the blowers. Due to its special rotor profiles, the Delta Hybrid is able to save energy by means of internal compression alone. For the first time in the low pressure market we succeeded in achieving such a significant saving without any loss in quality and reduction in reliability of the positive displacement blowers.

The future belongs to Hybrid blowers

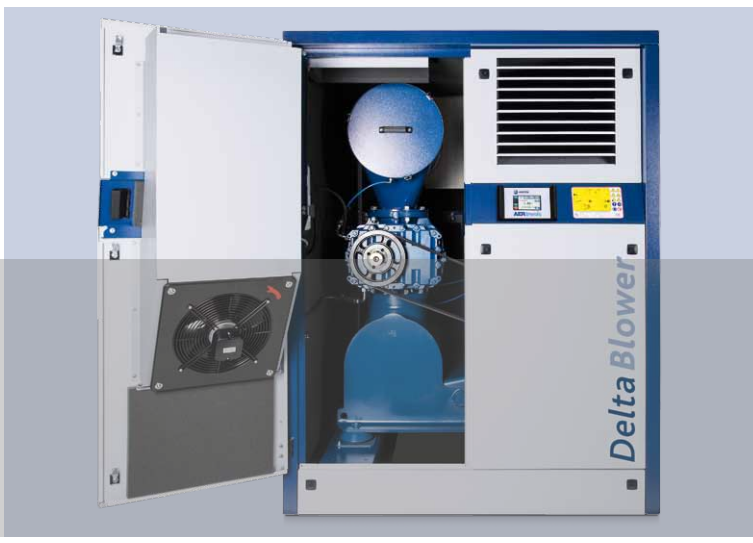
"We have a longstanding partnership with AERZEN and pursue a vision, which is characterised by quality, reliability and innovation," says Carlo Cella, CEO of QualiCal. On this project, the partnership resulted in very close co-operation between QualiCal and AERZEN at an early stage. The process data was analysed, simulated and, finally, the results were reflected in the blower technology. "The success is the result of a very trusting and extensive exchange of information. We are very good at burning lime, AERZEN is very good at generating process air – we complement each other very well," adds Cella, who is clearly pleased with the collaboration.

The new package at KöhlerKalk clearly shows how economic advantages, sustainability and increasing product quality can be reconciled. Even though the Hybrid technology is initially more expensive than conventional blower technology in terms of the hardware costs, the noticeably lower operating costs justify investing in Delta Hybrid rotary lobe compressors. From the point of view of the operator, Christian Köhler is convinced that the future belongs to Hybrid blowers in kiln construction for lime treatment. "Our kiln is the first in Germany to calcine dolomite in the GGR procedure. So, we are among the pioneers and are eager to learn what the efficiency gain after running-in operation will be," he says. ○

AERZEN positive displacement blower

The new generation Delta Blower G5^{plus} sets the standard

The new generation Delta Blower G5^{plus} is the result of the proven concept of our positive displacement blowers.



The new Delta Blower G5^{plus} positive displacement blowers made by AERZEN achieve a 5% higher level of energy efficiency, with even more flexibility and optimised design.

AERZEN has set the standard with the Delta Blower positive displacement blowers, and has now raised the bar even higher in terms of performance, efficiency and environmental awareness. To expand upon the success of the blower series, an exciting new design sets new energy saving records. The new generation Delta Blower G5^{plus} achieves up to 5% higher energy efficiency and offers more flexibility to meet special requirements.

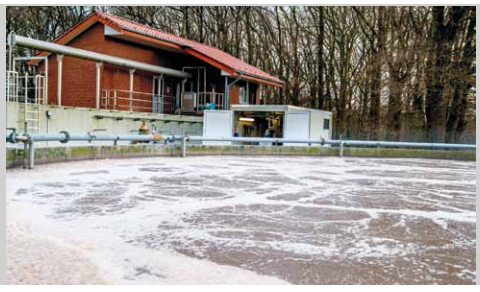
The Delta Blowers of Generation 5 made by AERZEN are almost universally applicable positive displacement blowers. Their performance data is impressive: they achieve intake volume flows between 30 and 15,000 m^3/h with a control range of 25% to 100% and overpressures of up to 1,000 mbar. Delta Blowers are suitable for use in many branches of industry, for example in waste water treatment plants, for ventilation, filter flushing, pneumatic and gas conveying, degasification or dedusting.

The new Delta Blower G5^{plus} is the result of the proven concept of our positive displacement blowers, taken to the next technological level. The new compact design means that installations take up less space in the machine room. According to AERZEN Environmental Concept, all blowers achieve oil-free class 0 as per ISO 8573-1, and they are 100% free of absorption material. Changing the oil is only necessary after 16,000 operating hours. Energy-efficient motors of class IE3 are applied as standard. The suction is on the cold side of the assembly.

A plus of efficiency, comfort and flexibility

What is absolutely new with the Delta Blower G5^{plus} is up to 5% more energy saving, achieved by means of an optimised intake filter silencer with lowest flow losses, highly-efficient electrically-driven fans and an optimised standard base support which makes reduced pressure losses possible. The warm exhaust air is routed over the roof of the acoustic hood, providing the possibility to connect an additional channel for optional heat recovery. But the "plus" also refers to the additional comfort. The new acoustic hood concept reduces the installation surface area by up to 10%, depending on the size. The acoustic hood door makes easier and faster access possible to facilitate the maintenance of the assembly. The multifunctional base support creates a plus of flexibility with an integrated spark arrester (ATEX), connectivity for the installation of a start unloading device and components for installation of third-party motors.

AERZEN supplies the technically optimised and conceptionally enhanced Delta Blower G5^{plus} positive displacement blower in two sizes at present, and more are being planned. ○



In the biology, designed for a population equivalent of 16,000, the aerobic and anaerobic phases for nitrogen composition alternate cyclically.

Short line at Emsbüren: the Aerzen turbo blower TB 50-0.8S is installed in a small, soundproof room directly beside the aeration tank.

Robust in operation: at Emsbüren, the AERZEN turbo saves quite a lot of energy

In the aeration tank, the turbo provides ventilation

At Emsbüren wastewater treatment plant, Wasserverband Lingener Land invested in new blower technology for the aeration tank. In comparison with the old assembly, the turbo blower made by AERZEN saves between 100 and 200 kilowatt hours every day. Modernisation of wastewater treatment plants in order to reduce their energy consumption benefits the entire population.

Wasserverband Lingener Land has four wastewater treatment plants in the towns of Lengerich, Freren, Spelle and Emsbüren. About 35,000 citizens in nearly 12,000 households are connected. With a capacity of 16,000 population equivalents, Emsbüren wastewater treatment plant is the biggest, and in the course of its modernisation, it was equipped with a turbo blower made by AERZEN. The compact unit supplies the aeration tank cyclically with oxygen for the oxidation of ammonium to nitrate. This had been preceded, in 2015, by equipping the basin, which has a depth of six metres, with modern fine-bubble diffusers made in Austria. According to the estimation of Hermann Schräer, a local skilled worker, the energy savings at the wastewater treatment plant, which amount to around 30 per cent in overall operation, are mainly due to the new aeration concept.

Modernisation with great effectiveness

"In the purification process, we are now working so productively that we could take one of our two aeration tanks out of operation," says Schräer. And this increase in effectiveness directly improves resource efficiency - for example, only one submersible mixer has to be used, instead of two. "The agitator only has a power of 3 kW, but that is three kilowatts saved over a long operating period," adds Schräer. After all, the agitators are working around the clock, as in Emsbüren the biology is not aerated in different zones of a basin but intermittently in one basin. This has a diameter of 24 metres and a capacity of 2,500 cubic metres.

The Aerzen Turbo blower TB 50-0.8S, with its electrical motor power of 42 kW and a maximum speed of 42,000 rpm, supplies a volume flow of up to 2,000 cubic metres per hour. The turbo blower installed beside the aeration basin in a compact building has to reach in its performance class a differential pressure of up to 800 millibar. This value is sufficient as the maximum back pressure at the ground of the biology, with a water depth of six metres, is 600 millimetres. As the air supply is provided only a few metres away from the basin, the efficiency increases once again. Shorter pipings reduce friction losses, thus resulting in a lower flow resistance in the system.

Energetically optimised turbo

The cyclic reduction of the nitrogen bound in ammonium and nitrate compounds makes it necessary that aerated and non-aerated phases alternate as far as time is concerned. At present, the daily operation comprises nine aeration cycles. The capacity of the turbo blower is controlled within the redox curve via the current actual value of the oxygen saturation in the water. "For the nitrification phase, an oxygen concentration of 2 mg/l has proved to be successful. If this value has been achieved the PLC reduces the capacity of the turbo," explains Schräer. If the wastewater plant blew in more air and increased the oxygen concentration to about 3 mg/l, on the one hand this would mean wasted money, and on the other hand the time required for the anaerobic nitrate removal would increase. At Emsbüren, they operate on the basis that a wastewater treatment plant will usually observe a COD value of 70 mg/l, but their average value is 40 mg/l. Therefore, Schräer assesses the available technology as "a very good solution, particularly for small wastewater treatment plants." During an aeration cycle, first of all the turbo blower starts operating for a few minutes at 100 per cent capacity, to set the wastewater in the basin in motion. For the remaining time, the plant runs energetically optimised at about 60 per cent of the maximum capacity. At present, the time span of the aerobic and anaerobic phases is fixed at approximately two hours. During the night, and with less inflow, longer periods apply and the considerably lower air requirement is covered by a small positive displacement blower.

At Wasserverband Lingener Land (WVLL), the turbo blower is the heart of the biology "and is running very well," says the skilled worker. In comparison with the replaced technology (an older turbo blower), the operation is extremely safe and energy efficient. The Aerzen Turbo type TB 50-0.8S starts with a power of 42 kW and then reduces to 23 kW. As improved energy efficiency always involves the correct design for the necessary air requirement, the blower capacity has been designed exactly for this basin. The old blower, manufactured in 2001, had been dimensioned generously and had a connection capacity of more than 70 kW - too much for the aeration system of 2,500 cubic metres and its basin with a depth of six metres and a diameter of 24 metres.

While magnetic bearings involve an extremely complex regulation and monitoring of the function, the Aerzen Turbos work with a simple and effective air foil bearing. A specialist in blower and compressor technology uses as a maintenance-free friction partner a 2-pot coating. One of these materials is polytetrafluorethylene. PTFE is a thermoplastic, which, due to its very low coefficient of friction, is used as a non-stick coating.

Conclusion

The wastewater treatment plants of WVLL Emsbüren show the energy saving advantages offered by turbo blowers even in relatively small biological basins. Moreover, the robust construction of the turbo series TB makes it possible to end continuous operation and to operate the turbo cyclically instead. Thus, this procedure forms the basis for a simple and effective modernisation of small municipal wastewater treatment plants in the countryside. At Wasserverband Lingener Land they are already planning their next projects. ○

Hermann Schräer, skilled worker at Emsbüren

The turbo is running very well

New Aerzen subsidiary in Argentina

On 1st May 2017, Aerzen Argentina S.R.L. commenced business operations, headed by Alejandro Knoop, based in the suburb of Vincente Lopez of the Argentine capital Buenos Aires. Cristina Pilz is working for Aerzen Argentina as the office's administrative assistant. There were two reasons for the foundation of the 49th AERZEN subsidiary: on the one hand, a U.S. company had taken over the AERZEN representative in Argentina, which had been working for us there for 37 years, and this led to the fact that AERZEN products were no longer in focus; on the other hand, the arrival of the new Argentine Government has been accompanied by signs of an economic upswing. An important partner is Germany, as it became clear on the occasion of Angela Merkel's visit to Buenos Aires on 8th June. Alejandro Knoop was also invited to the gala dinner with the Argentine President Mauricio Macri and the Federal Chancellor – a great honour for him and Aerzen Argentina.

In the initial phase, Aerzen Argentina will focus on serving existing customers. The wide distribution of AERZEN machines in many main applications provides a good basis for the successful establishment of this new subsidiary. In 2018, sales and service activities will be extended.

The AERZEN duo in Argentina Alejandro Knoop and Cristina Pilz

Aerzen U.S.A. opens sales office in Houston

Aerzen USA based in Coatesville, Pennsylvania is on an expansion track: This is evidenced by the recent opening of our American subsidiary's first regional sales office in Houston, Texas. We will now have the opportunity to support our numerous customers in the Gulf of Mexico region directly and more intensively, while also gaining new customers. There are many important refineries and petrochemical plants on the Gulf coast, where our blowers for pneumatic transportation and our process gas compressors are in operation. "Close cooperation with our customers is the key to our mutual success," says Tony Morris, Managing Director, Aerzen U.S.A. On 20th April 2017, many customers and business partners celebrated the Open House day of the new office in Houston. Employees mainly in sales, application technology and support work in this building, which is also equipped with a conference and training room.

This building in Houston houses the regional sales office of Aerzen U.S.A.

Exhibition dates (second half of 2017)

Seminar-Performance[3], Beijing/China 5th/6th July 2017
KZN Industrial Technology Exhibition, Durban/South Africa 26th until 28th July 2017
EA Water Expo, Delhi/India 9th until 11th August 2017
Seminar-Performance3, Guangzhou/China 6th/7th September 2017
IFAT, Johannesburg/South Africa 12th until 14th September 2017
Turbo Show, Houston/U.S.A. 12th until 14th September 2017
PERUMIN 33, Arequipa/Peru 18th until 22nd September 2017
WCW, Saskatoon/Canada 19th until 22nd September 2017
T-Plas 2017, Bangkok/Thailand 20th until 23rd September 2017
IMA, Hamelin/Germany 22nd/23rd September 2017
PowTech, Nuremberg/Germany 26th until 28th September 2017
IFAT 2017, Mumbai/India 27th until 29th September 2017
WEFTEC, Chicago/U.S.A. 30th September until 4th October 2017
Fenasan, São Paulo/Brazil 3rd until 5th October 2017
Easy Fairs Solids, Rotterdam/Netherlands 4th/5th October 2017
PCVExpo, Moscow/Russia 24th until 27th October 2017
Aquarama-TNAV, Leuven/Belgium 25th October 2017
Plastic & Rubber Indonesia, Jakarta/Indonesia 15th until 18th November 2017

Questions, Suggestions, Ideas?

We are looking forward to all your queries, comments and suggestions on our customer journal and we are at your disposal for further information on AERZEN products and services. Give us a visit on our website:

www.aerzen.com/news

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AERZEN COM•PRESS
Customer journal of
Aerzener Maschinenfabrik GmbH
Edition 2•2017

Editor
Aerzener Maschinenfabrik GmbH
Reherweg 28
31855 Aerzen GERMANY

Editorial staff
M/Stephan Brand (v.i.S.d.P.), Sebastian Meißler, Frank Glöckner, Klaus Grote, Klaus Heller, Pierre Noack

Picture credits
AERZEN, Aerzen U.S.A., Aerzen Argentina

Realisation
Maenken Kommunikation GmbH
Von-der-Wettern-Straße 25
51149 Cologne
Number of copies: 4.600

Aerzen Systems: complete packages around two-stage, oilfree compressing screw compressors

Customised compressed-air solutions from one single source

VMT 4 W Compressed-air assembly, used in food industry

Team Aerzen Systems (f.l.): Tim Schultze, Florencio Cabanillas and Eugen Dirksen

Tim Schultze, Manager Aerzen Systems

There is nothing, that we cannot manage.

The name of the company is their programme: Aerzen Systems GmbH offers complete compressed-air system solutions from a single source. Conception, planning, installation and maintenance – all of this plus more, including complete packages for customer-specific realisation of compressed-air stations.

For the last eight years, Aerzen Systems GmbH has been responsible for the business of customised two-stage, oilfree compressing screw compressors. "Customised" means: that solutions from Aerzen Systems involve special designs which precisely meet customers' needs and specifications.

The technical heart is a modified AERZEN screw compressor capable of operating in a bandwidth of between 5 and 10 bar (g) pressure, with volume flows of between 600 and 8,000 m^3/h and at driving speeds of between 90 kW and 1,000 kW. All accessories, such as compressed-air filters, driers and reservoirs, superordinated control, pipings and exhaust air channels can be included, if necessary. Aerzen Systems offers maximum flexibility, as Managing Director Tim Schultze makes clear: "Unlike our competitors, we are not restricted to certain manufacturers or products, so, the customer gets either the best, or the most suitable, accessories for his project. Moreover, we only work with standard parts which can be purchased on the open market." All details are fixed during project discussions with the customer at site.

"There is nothing, that we cannot manage"

However, this AERZEN subsidiary focusses not only on providing quotations for complete compressed-air stations, but also offers interested parties an extremely broad range of other services. These include the provision of advice, planning support, project management (including expediting and site supervision), assembly, commissioning and after-sales service, as well as plant monitoring with vibration measurements or using the WebView module from AERZEN. Moreover, the portfolio includes special solutions and equipments – whether it involves external installations for operation in extreme cold or heat, drives with turbines or Diesel engines, designs for explosive ambient air (ATEX) or with HOC-driers (heat of compression) for utilisation of compressor waste heat, as well as assemblies for compression of inert gases such as argon, helium and nitrogen. "There is nothing, that we cannot manage", says Schultze.

The capabilities of Aerzen Systems includes a large-scale project at a company in the packaging industry in Berlin. There, a new compressed-air station needed to be planned, all components had to be purchased, the old station had to be demolished during live operations, the emergency supply had to be provided via rental compressors from AERZEN Rental Division, the new station had to be installed, including piping construction, insulation work, as well as electrical cabling, then the rental compressors had to be dismounted, and finally, the new station could be completed.

Concentrated know-how: the Aerzen Systems Team

All three Aerzen Systems employees have many years of experience in the compressed-air industry. Tim Schultze was part of the foundation team, and since April 2013 has had overall responsibility as manager. He is an economic engineer (BA) and Master of Science in Industrial Engineering. At the beginning of 2014, Sales Engineer Florencio Cabanillas moved over from AERZEN sales office North in Walsrode to Aerzen Systems and is mainly active in acquisition. Eugen Dirksen is a qualified technician and is primarily responsible for project management in internal services.
Contact information for Aerzen Systems:
• Telephone: +49 511 646628-11
• Web: www.aerzen.com
• email: info@aerzener.de

Aerzen Systems has obtained around 150 orders such as this in the last few years. The company is called upon wherever oilfree compressed-air is required as the driving medium for machines, for example, in power stations and refineries, chemical, steel and food industries or at gas manufacturers and pharmaceutical companies.

From its central, and very conveniently situated, location in Hanover, the Aerzen Systems Trio (see Infobox) also serves international customers and interested parties for AERZEN subsidiaries, particularly those in neighbouring European countries. The proximity to the head office of Aerzen means that assembly inspections and factory visits can easily be arranged for customers.

Oilfree compressing screw compressors are completely on trend

Aerzen Systems has become firmly established in the market with its range of services – and the signs are that growth will continue: After the first quarter 2017, which saw the best level of incoming orders in the company's history, a successful presentation at ComVac followed in Hanover at the end of April, with a new visitor record at AERZEN's booth and correspondingly a lot of contacts. "The fair reflected the increasing trend of screw compressors with oil cooling to oilfree compressing screw compressors which offer compressed-air of high quality," adds Schultze, who looks forward to ComVac 2019. With a new generation of machines, AERZEN will also serve the standard market for two-stage, oilfree compressing screw compressors – appealing perspectives for AERZEN customers which also suggest that there are good prospects for Aerzen Systems to expand strongly.

For the food industry: a VMT 1 L compressed-air assembly with compressed-air drier and compressed-air filter