COM·PRESS

AERZEN at Solvay: an XXL overhaul

AERZEN screw compressor defy aggressive lime kiln gas

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AERZEN
EXPECT PERFORMANCE

Dennis Hubel, Communication & Branding, Marketing AERZEN

Dear Readers

Trade fairs are very important for AERZEN: they are a showcase for our innovations, a meeting place for new contacts and a valuable opportunity to deepen existing partnerships. All of this also applies to our participation in POWTECH TECHNOPHARM 2025 in Nuremberg.

Under the motto "The new pulse for process air applications", we present our wide-ranging portfolio of process air solutions with numerous innovations and customer-specific special solutions. The two new sizes D23S and D31S of our Delta Hybrid screw blower with direct drive are celebrating their première. The new VM 200 screw compressor from the Delta Screw series offers robustness, durability and performance for countless applications. We are also pleased to present our new double-stage, oil-free DS series air compressors with up to 10.5 bar.

On the following pages you will also find exciting insights into flexible and efficient AERZEN solutions in a wide range of sectors and industries. One example is the first use of screw blowers for the pneumatic transport of fish feed in marine aquaculture. Another article discusses an extensive revision of AERZEN process gas compressors that compress aggressive lime kiln gas in a soda plant. It is also interesting to see how our energy-efficient blower technologies provide the combustion air for lime production - in conjunction with the new AERZEN Load Balancing Control. This intelligent control software opens up significant potential for the energetic optimisation of compressed air generation.

Already in spring, we have celebrated the market launch of our new air compressors at the Hanover Fair 2025. AERZEN now offers a comprehensive and ultra-modern product portfolio of oil-free and oil-injected compressors for industrial compressed air applications in the pressure range from 2.5 to 40 bar.

So there will be plenty of interesting discussions at the AERZEN stand in Nuremberg and at our numerous other international trade fair participations. With this in mind, I hope you enjoy reading our new issue of ComPress. LET'S TALK!

Yours,

Dennis Hubel

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Cover picture: *Compressors are the centrepiece of the soda ash plant at the Solvay plant in Bernburg. They convey the lime kiln gas to the downstream processes and thus keep the entire production process running. The largest compressor on site is the VRO836 from AERZEN. The oil-free screw compressor guarantees maximal reliability in every process. The latest overhaul has confirmed this: even after more than a quarter of a century in use, the package is still in top form. The secret of high machine availability? High-quality technology and excellent service. AERZEN offers both from one single source. You can find out more on pages 4 to 9.*

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Martin Gräsl takes over as Managing Director of AERZEN Deutschland GmbH & Co. KG.

Hubertus Schrage will become interim Managing Director of Rudolf Messner Umwelttechnik AG.

AERZEN Deutschland and Rudolf Messner Umwelttechnik with new Managing Directors

Martin Gräsl will be new Managing Director at AERZEN Deutschland, effective 1st October 2025. He studied electrical engineering and before his time as managing director at Rudolf Messner Umwelttechnik AG (RMU AG), he held responsible positions at Passavant-Geiger and Bilfinger Water Technology, among others. Martin Gräsl brings experiences in components and system businesses.

Martin Gräsl's successor at RMU AG will be Hubertus Schrage. He leads the AERZEN product line Water Treatment System, which includes RMU AG as well as the companies STS, Aquarius and Suprafilt, and will take over the management of the RMU AG on an interim basis.

A trio leads the **AERZEN** companies in Hungary

AERZEN is getting ready for the future in Hungary: due to the expected strong growth, the ranges Sales/After Sales and Production of the refrigeration packages were split into two separate units.

Sales and After Sales remain in the AERZEN subsidiary Aerzen Hungária Kft. based in Budapest and Tat. The new General Manager is József Nagy. He previously held various sales management positions at Lenze, a manufacturer of drive technology and automation systems. Most recently, József Nagy worked there as Country Manager Hungary.

The new General Manager Balazs Debreceni, who brings his experience from management positions at the mechanical engineering company Wilo in Germany and Indonesia, is responsible for the production of refrigeration and process gas systems in Esztergom.

The Co-General Manager of Aerzen Hungária Kft. is Ladislav Binko, who also manages the production unit Aerzen Operations Hungaria Kft. In addition, Ladislav Binko continues to act as AERZEN Director Central and Eastern Europe.

The three General Managers of the AERZEN subsidiaries in Hungary (from left): Balazs Debreceni, Ladislav Binko and József Nagy.

Erdem Yüksek is the new Managing Director at Aerzen Makine.

Change in the management of **AERZEN** in Turkey

Since June 15, 2025, Erdem Yüksek has been the new Managing Director at Aerzen Makine, the Turkish AERZEN subsidiary located in Ümraniye near Istanbul.

Erdem Yüksek received his bachelor's degree in mechanical engineering from Istanbul Technical University, followed by a master's degree in production engineering and management from KTH Royal Institute of Technology. He has over 15 years of professional experience in the industrial equipment sector, having worked with GEA Group, Ford Motor Company, Sandvik, Dalgakiran Kompresör and finally Burckhardt Compression. His work has focused extensively on air and industrial gas compression technologies, in which he has developed over 10 years of specialised expertise.

AERZEN at Solvay: **an XXL overhaul**

Non-stop power - **AERZEN** screw compressors defy aggressive lime kiln gas in Bernburg

Compressors are the centrepiece of the soda ash plant at the Solvay plant in Bernburg. They convey the lime kiln gas to the downstream processes and thus keep the entire production process running. The largest compressor on site is the VRO836 from AERZEN. The oil-free screw compressor guarantees maximal reliability in every process. The latest overhaul has confirmed this: even after more than a quarter of a century in use, the package is still in top form. The secret of high machine availability? High-quality technology and excellent service. AERZEN offers both from one single source.

Digital information
Further information on various website links and QR codes on page 9.

The VRO836 from AERZEN, one of the largest process gas compressors in the world, was completely dismantled during the overhaul.

An overhaul is always a kind of grab bag: you never know what to expect when the machine's internals are revealed. With AERZEN, we have the expertise directly on site. Should problems occur, they can be quickly rectified. We can also exchange ideas and learn from each other. That's great - particularly for our young colleagues.

Thomas Bäuml,
head of the main workshop at Solvay in Bernburg

Around 35,000 m^3/h volume flow, 2.7 MW drive power, 29 tonnes in weight: the VRO836 from AERZEN is a real giant. Its service life is also remarkable: for more than 25 years, the oil-free process gas compressor - incidentally one of the largest in the world - has been in operation at Solvay's Bernburg soda works and delivers top performance every day. An overhaul of the XXL package is only required after five years of operation and is carried out within the scope of a regular maintenance interval. The result of the latest general overhaul, which was carried out by AERZEN service personnel on site at the customer's premises: the machine is in top condition. This is not a matter of course, as the VRO836 is used in Bernburg for the pneumatic transport of lime kiln gas, which is highly corrosive - a major challenge for the materials and components.

Soda location with 140 years of history

The plant in Bernburg (Saale) is one of the oldest locations of the Solvay Group. Soda ash production began there as early as 1883. Today, the Group produces soda ash, sodium bicarbonate and hydrogen peroxide in Saxony-Anhalt - and is the world market leader in these products, which are indispensable in many aspects of daily life. They are used in the manufacture of glass, food, detergents and cleansing agents and also play an important role in metal processing, pharmaceuticals, the electrical and computer chip industry and environmental protection.

The Solvay plant in Bernburg is located directly on the Saale river.

Soda is originally a natural product that was created by evaporation at the edge of salt lakes and was and is usually mined. Ernest Solvay, one of the two founders of the Solvay Group, succeeded in 1861 in developing a process through which soda ash could be produced inexpensively on an industrial scale. To this day, synthetic soda is produced worldwide using the Solvay process (also known as the ammonia soda process).

Quicklime and lime kiln gas are produced in the burner

The base materials for soda ash production are salt, limestone and anthracite or coke as well as ammonia, which is used as an auxiliary material. The limestone (calcium carbonate, $CaCO_3$) that is processed at the Bernburg plant comes from a nearby open-cast mine and is transported from the extraction area to the plant site via an in-house plant railway. In the lime kilns, the rock is decomposed into quicklime (calcium oxide, CaO) and lime kiln gas, a gaseous mixture with a high carbon dioxide content (CO_2). Although the lime kiln gas is only a by-product of the firing process, it is essential for the downstream processes.

Pneumatic transport of lime kiln gas

"We need lime kiln gas in a variety of applications as process gas. If it is not available in sufficient quantity and quality at the correct time, the entire soda production process comes to a standstill. It is therefore very important that the compressors we use for the pneumatic transport of the lime kiln gas achieve an elevated level of availability," says Andreas Boinski, Head of Technology at Solvay GmbH in Bernburg. Sabine Zepperitz-Thews, Head of Technical Office, adds: "We have been working closely and confidently with AERZEN for many years. The company is simply the number one when it comes to large volume flows. The machines are robust, durable and absolutely reliable. This secures our production."

Robust technology, reliable operation

The VRO series (today known as the VRA) which is used in Bernburg, is designed for the special requirements of process gas compression and is certified for plants in the chemical and petrochemical industry as well as many other ranges of process engineering. The machines compress and convey almost all gases occurring in the industrial range and are extremely reliable and efficient in operation. They often run flawlessly for decades with minimum maintenance costs. For operators, this means maximal process reliability and reduced investment and operating costs.

Oil-free compression for 100% product purity

VRO and VRA compressors are largely insensitive to contamination and polymerisation and enable particularly high pressure loads and rotor speeds. There is no metal contact in the compression chambers – neither between the two rotors nor between rotors and the housing. This ensures an absolutely oil-free working method, as the conveying chambers and thus the conveying medium - in this specific application the lime kiln gas - remain 100% pure. At Solvay, a labyrinth seal also ensures that the compressors are gastight. The bearings achieve a service life of up to 80,000 operating hours.

One of the two rotors. The special profiles from AERZEN secure the decisive performance plus.

Overhaul of the superlatives

But even the best technology needs a check-up from time to time. Due to its enormous size and immense weight, the VRO836 was overhauled on site in Bernburg. The general overhaul was carried out by experienced service technicians from AERZEN. The technicians know the compressor inside out and specialise in getting the machine up and running again within the shortest possible period of time. "An overhaul is always a kind of grab bag: you never know what to expect when the machine's internals are revealed. With AERZEN, we have the expertise directly on site. Should problems occur, they can be quickly rectified. We can also exchange ideas and learn from each other. That's great - particularly for our young colleagues," says Thomas Bäuml, head of the main workshop in Bernburg.

Broken down into all individual components

The system was completely dismantled and broken down into its individual components. Everything was inspected, cleaned and, if necessary, repaired or replaced. Only AERZEN original spare parts were used. These are specially designed for AERZEN compressors and blowers and have optimum compatibility. This enables full functionality for smooth operation and a long machine service life. As a rule, repair and wear parts are available from stock for all standard products. A comprehensive network of service centres and decentralised parts warehouses secures short distances and fast reaction times. All valves and measuring equipment were also tested and recalibrated. The machine was then completely re-assembled and put back into service.

Installing the seals/carbon rings into the housing

Preparations for the installation of the rotors

The condition of the compressor is impressive

The lime kiln gas in the Bernburg soda works is very corrosive and pushes many materials to their limits. The AERZEN screw compressor was not troubled by these adversities and presented itself in top condition: hardly any wear, no leaks, no bearing damage, best vibration behaviour, full reliability. "The condition of the compressor was excellent. That is really remarkable. We are delighted," adds Thomas Bäuml.

But how has the VRO836 been able to deal with the challenging conditions so well over the years? The robust design, the innovative technology, the resistant surface coating (chemical coating) and the use of a special material pairing of rotor and housing should be emphasised at this point. The regular maintenance and services from AERZEN have also played their part. Speaking of services: the services include quotations for every phase of a machine's life and are customised precisely to the individual needs of the customers. The result: the highest possible machine availability and optimum cost efficiency.

Trusted cooperation

"We strive for high availability of our systems. That's why it's important to us that the result after the overhaul is virtually as good as new," emphasises Andreas Boinski: "AERZEN is an excellent service partner. The overhaul was carried out competently and efficiently so that the compressor was ready for use again very quickly. The experienced technicians not only know their machines inside out, but are also very familiar with the conditions on site and our processes. That is very important to us and makes collaboration easy."

By the way, the VRO836 is not the only AERZEN compressor at Solvay. The entire group of companies trusts the compressor specialist's reliable technology and excellent service. ○

Further information

https://www.aerzen.com/products/screw-compressors/process-gas-compressors

https://www.aerzen.com/applications/chemical-and-process-technology

https://www.aerzen.com/applications/process-gas-technology

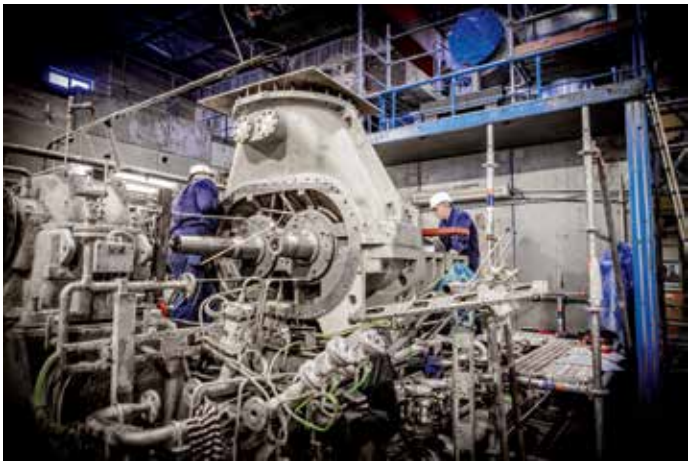
https://www.aerzen.com/applications/pneumatic-transport-for-bulk-material-handling/safety

https://www.aerzen.com/services/field-service/repairs

https://www.aerzen.com/services/original-aerzen-parts-1

https://www.aerzen.com/services/overview

https://www.solvay.com/de/germany



Assembly is progressing.

AERZEN expands its Delta Hybrid screw blowers with the D23S and D31S sizes and indicates how maximum performance and sustainability can be successfully combined.

More efficiency for the future

AERZEN Delta Hybrid with new sizes: D23S and D31S

The AERZEN Delta Hybrid with direct drive sets new standards in process air generation. The innovative screw blowers are digitally ready and impress with optimum energy efficiency, minimum footprint, maximum user-friendliness and absolute process reliability. Now, the compressor specialist is presenting two additional sizes D23S and D31S, thereby consistently pursuing its course towards even more efficient and sustainable compressed air supply. The new packages will make their debut at POWTECH in September 2025, with series production scheduled to start in early 2026.

With the new D23S and D31S models, AERZEN is expanding its successful Delta Hybrid series with two sizes that are far ahead of their time in terms of efficiency. At its centre is the well-known direct drive system using gear wheels, which, in combination with the new, optimised rotor profiles, ensures higher efficiency while also improving acoustic properties. The IE5 motors are a particular

highlight: the innovative synchronous reluctance permanent magnet motors significantly exceed the efficiency of IE4 motors and set new standards in energy savings - even in the partial load range. This underlines AERZEN's leading role in compressed air technology and indicates how high performance and sustainability can be successfully combined. In future, efficiency class IE5 will be consistently taken into account in all Delta Hybrid developments.

Innovative design, maximum reliability

Both sizes convey 100% oil-, absorbent- and PFAS-free process and compressed air (oil-free operation according to ISO 8573-1, class 0) and offer a very large turndown ratio of 1:5. One VFD is already integrated and ensures precise and stepless adjustment of the volume flow to the current demand. The packages are designed for maximum reliability and durability and guarantee absolute process safety - thanks to bearings with a theoretical service life of more than 60,000 operating hours, pressure lubrication of the anti-friction bearings, extended oil change intervals of up to 16,000 operating hours and the use of an oil level switch to actively monitor the oil level. The drive components are completely maintenance free.

Plug-and-play solution to meet the highest demands!

Delta Hybrid packages are fully pre-assembled and pre-programmed and are therefore immediately ready for connection and operation. Their extremely compact type of construction with a footprint of only 1.68 m^2 allows for a particularly space-saving installation, and even a side-by-side installation of several machines can be easily implemented. Operation and maintenance are performed exclusively from the front and rear. With a maximum sound pressure level of 73 dB(A), these machines are among the quietest in their performance class on the market.

Delta Hybrid screw blowers can be used globally - even in zones with extreme ambient temperatures of up to +50°C.

AERtronic - the path to the digital future

With the integration of the intelligent AERtronic® package control system, AERZEN actively supports its customers in their move towards digitisation and makes their systems fit for the networked future. AERtronic enables comprehensive monitoring and precise control of suction, system and oil pressure as well as oil and discharge temperature of the compressed air, thus creating maximum transparency, highest operational reliability, perfect machine availability and optimum efficiency.

Process air supply of the future

The Delta Hybrid combines state-of-the-art drive technologies with exceptional energy efficiency (energy savings of up to 37% compared to conventional blowers), optimised acoustics and extreme compactness. It impresses with above-average durability and reliability, easy installation and commissioning, minimum maintenance costs and quiet operation – combining all the properties that modern users expect from a top-of-the-range solution. The new sizes expand the series, which will in future include the sizes D23S, D31S, D40S, D50S, D65S and D80S. ○

Comprehensive range of options and modifications

AERZEN offers a wide range of modification options specifically for pneumatic conveying. These include silencers without absorption material, packages without integrated VFD, customised motors or designs in accordance with the ATEX directive – for a tailor-made design.

	D23S	D31S
Volume flow:	max. 1,460 m^3/h	max 1,800 m^3/h
Turndown ratio:	1:5	1:5
Differential pressure:	up to 1,250 mbar (g)	up to 1,250 mbar (g)
Motor rating:	37 kW	45 kW
Sound pressure level:	max. 72 dB(A)	max. 73 dB(A)
Installation space:	1.64 m^2	1.64 m^2

Further information

https://www.aerzen.com/product/screw-blower-delta-hybrid-direct-driven

https://www.aerzen.com/products/control-technology/aertronic-unit-control

AERZEN is expanding its Delta Screw compressor series to include the VM 200.

New size for the compressor series from **AERZEN**

Expansion of the screw compressor series in the upper volume flow range

The successful Delta Screw series from AERZEN is growing: with the new VM 200 model, the versatile compressor series grows to a total of twelve options. Developed for use in the upper volume flow range, the VM 200 impresses with its energy-efficient technology. The new compressor stage will celebrate its premiere at this year's POWTECH in Nuremberg in September.

The new compressor covers volume flows from 3,500 to 12,200 m^3/h and differential pressures of up to 3.5 bar - and thus fulfils industry-specific requirements in the low pressure range. This is AERZEN's response to the growing demand for high-performance, sustainable systems. With the VM 200, the product range now includes twelve sizes in the range from 1,700 to 15,000 m^3/h and drive powers from 200 to 1,000 kW.

Technology that makes the difference

For a package in the volume flow rate class, the VM200 impresses with its compactness, for example due to the space-saving, horizontal configuration of the discharge silencer.

AERZEN's solution is completely oil and PFAS-free (ISO 8573-1, class 0) - a unique position in the market. The absence of a coating on the rotors ensures additional process reliability.

Maximum adaptability with minimum operating costs

The VM 200 also scores highly in terms of flexibility: different configuration options and an extensive range of accessories allow customisation to a wide variety of applications. Intelligent control systems and maximal operational reliability are ensured by the proven AERtronic software. The integrated operating panel allows reliable monitoring of suction, discharge and oil pressure as well as temperature values. Like all Delta Screw compressors, the VM 200 also impresses with its excellent energy balance. Thanks to the well thought-out overall concept of efficiency, resource conservation and safety, energy and maintenance costs can be reduced - with an assumed operating time of ten years, the investment is almost amortised.

The flexible concept of the Delta Screw series also allows customised special solutions such as special motors, acoustic hoods for special environmental conditions or special instrumentation. The series is easy to service and maintain. The service life of the lubricating oil for the bearings of 16,000 operating hours, which corresponds to maintenance intervals, is another positive contribution. ○

Further information

https://www.aerzen.com/product/screw-compressor-units-delta-screw-with-direct-drive

https://www.aerzen.com/products/control-technology/aertronic-unit-control

Aerzen Rental supplied a completely temporary compressed air station for a project by E.ON and DS Smith.

Aerzen Rental: the right partner for compressed air solutions, even in the 10 bar range

Planning, project planning and implementation from one provider

With an order in Aschaffenburg, Aerzen Rental once again proves to be a competent partner for complex applications and solutions in the 10 bar compressed air range.

Energy supplier E.ON and packaging manufacturer DS Smith are cooperating on the construction of an ultra-modern power plant at DS Smith's manufacturing site in Aschaffenburg. Both companies are already customers of Aerzen Rental, the global specialist for temporary compressed air and process air solutions within AERZEN Group.

The plant in Aschaffenburg combines technologies for generating energy from the location's production waste with a highly efficient combined heat and power process. Oil-free compressed air is required for flushing and drying the piping network under construction and for test runs of the turbines.

E.ON commissioned Aerzen Rental to supply a turnkey system, from planning and assembly to support for a completely temporary compressed air station. The station consists of an oil-free compressor, a hot regenerating adsorption dryer, an air vessel, a power distributor, power cables as well as piping and hose pipes (see box). The entire plant is monitored remotely by Aerzen Rental.

A particular challenge is the operation of two different compressed air networks with different working pressures. "We found a solution for this too by installing a pressure control valve on an additional outlet from the air vessel," explains Peter Link, Sales Manager Aerzen Rental Germany, Austria, Switzerland and Denmark

The compressed air station was put into service at the beginning of 2025 as a temporary rental solution and is currently still in operation. ○

Key data and components at a glance

Operating points:

- Volume flow Q = 500 - 700 Nm^3/h at a working pressure of 7 bar g
- Pressure dew point according to ISO 8537-1 = > -40°

The following were delivered:

- Oil-free compressor TVO 810
- Warm regenerating adsorption dryer
- 5 m^3 air vessel
- Field distributor including cable set
- Hose set with various connections to increase flexibility

Revolution in salmon farming

First use of **AERZEN** screw blowers for the pneumatic transport of fish feed in marine aquaculture

Farmed salmon in marine aquacultures are usually fed via automatic feeding systems. At a Chilean salmon farm in Patagonia, six AERZEN Delta Hybrid D13S screw blowers now ensure efficient, even and reliable distribution of the feed - a revolution in the sector and an important step towards greater sustainability. Energy and resource efficiency, environmental protection, process optimisation, digitisation and cost reductions are the key buzzwords here.

The world loves fish. Around 20 kg are consumed per capita per year on average – and the appetite is growing. To meet the growing demand, the fish industry is increasingly turning to aquaculture. More than half of the world's edible fish already comes from controlled farms. For certain fish species, including salmon, this proportion is even higher. Chile is one of the most important countries of origin for farmed salmon. The South American country is the second largest producer and exporter after Norway. The waters and fjords south of the

Digital information
Further information on various website links and QR codes on page 17.

port city of Puerto Montt, also known as the "Gateway to Patagonia", are considered the epicentre of Chilean salmon farming.

Pneumatic transport of fish feed in salmon farming

One of the salmon farms has six complete feeding lines for two separate modules with a total of 14 net cages. Around 980,000 salmon are supplied here. This is done using special feeding vessels equipped with automated systems for storing, dosing and pneumatic conveying of the feed to the fish. Since summer 2025, six AERZEN screw blowers from the Delta Hybrid D13S have been in use. They transport the feed from the storage silos to the net cages and ensure efficient, reliable and economical operation.

The 60-day test phase was a complete success

Screw blowers for pneumatic conveying of fish feed in marine aquacultures? This has never happened before. Conventional lobe blowers are usually used for this application – and that was also the case here. However, a 60-day test phase with the AERZEN Delta Hybrid exceeded all expectations and delivered such excellent results that the changeover to the new technology was quickly decided. The high energy efficiency, the lower operating costs, the smaller motor size and the constant reliability of the screw blowers were particularly convincing. The decision in favour of the six Delta Hybrid not only reflects the technical excellence of the AERZEN machines, but also the high level of satisfaction with the support and service. The AERZEN team worked closely and promptly throughout the process, demonstrating technical expertise and a depth of understanding of the application's specific challenges.

Photos: Shutterstock

Around 980,000 salmon are bred in the aquaculture facility.

Salmon is one of the most popular fish worldwide.

AERZEN screw blowers in salmon farming - the advantages at a glance

- Reduction in energy consumption
- Reduction of the CO_2 carbon footprint
- Increased production output
- Reduced need for additional equipment such as diesel generators, VFDs or aftercoolers
- Better conveying quality due to lower discharge temperatures
- Compact and robust design
- Constant reliability even under harsh ambient conditions (offshore)
- Improved control system and remote monitoring thanks to digitisation of the process with the intelligent AERtronic package control system
- Alignment with ESG goals (ESG stands for Environment, Social, Governance and describes a comprehensive framework of criteria for the consideration of environmental, sustainability and social issues in corporate governance)

Special requirements on blower technology

Offshore applications such as marine aquaculture pose special challenges. They are far away from electricity sources and have to be powered by diesel generators, which results in a high CO_2 carbon footprint. The feeding vessels are constantly moving and have limited space. The environment is also salty, corrosive and humid. No problem for the screw blowers and rotary lobe compressors from AERZEN. The innovative packages combine the advantages of blower and compressor technology in a single system and have long been considered the ultimate in pneumatic conveying of sensitive, powdery and granular media – regardless of the conditions.

AERZEN Delta Hybrid: energy-saving champion with impressive qualities

AERZEN Delta Hybrid stand for maximal energy efficiency, minimum life cycle costs, absolute process reliability as well as high durability and represent 100% oil-free, absorbent-free and PFAS-free process air (oil-free operation according to ISO 8573-1, class 0). The robust and service-friendly design (including a patented storage with a service life of up to 70,000 operating hours) ensures a high level of machine availability. The comprehensive range of options and integrated modifications allows targeted customisation to individual customer process requirements and ensures the greatest possible flexibility in the design of machines and systems.

Efficient operation, small motor sizes, digital remote monitoring

Six AERZEN Delta Hybrid of size D13S are in operation on the fish farm in Patagonia. These compact packages each have a drive power of 16.68 kW and deliver a volume flow of 10 m^3/min at a differential pressure of 770 mbar. The

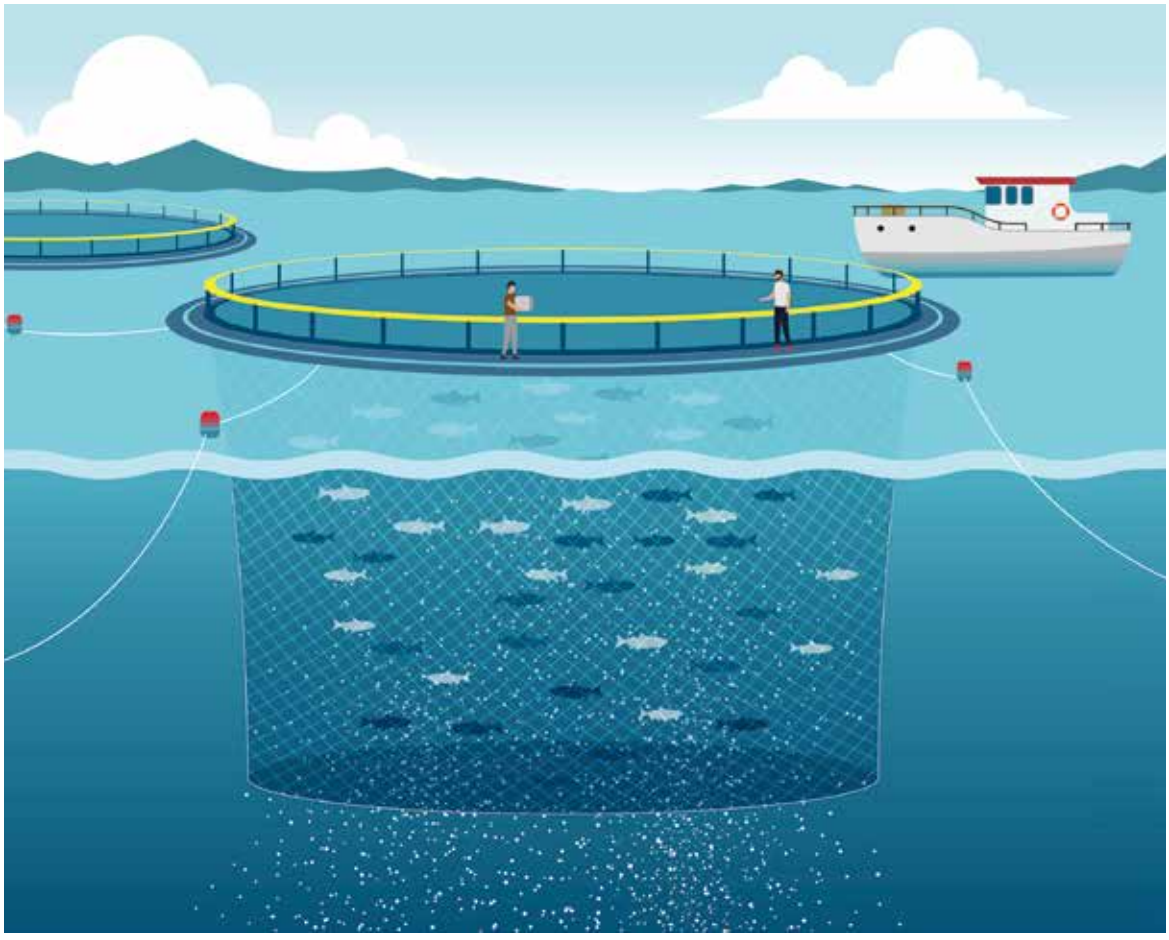
discharge temperature is 52.7°C – which is 15°C lower than with conventional positive displacement blowers. This has a positive effect on the quality of the fish feed and the conveying process. Due to the limited space available on the feeding ship, a special non-acoustic version of the acoustic hood was chosen. The intelligent package control AERtronic takes over the efficient control of the screw blowers and enables safe remote access to the operating and service data of the machines.

Optimised feeding process and better water quality

Digitisation and automation of the pneumatic feeding process offer numerous advantages for people, salmon and the environment. The control system and control of the amount of feed released ensure precise and even distribution in the breeding environment and ensure that all fish have access to the feed - competition is avoided and even growth of the salmon is ensured. It also reduces food wastage in the water. This is not only advantageous from an economic point of view, but also improves the water quality, as the accumulation of food residues can lead to problems due to nutrient build-up and bacterial growth. Pneumatic conveying technology minimises these risks, as only the quantity of feed actually required is dispensed. This means that less uneaten food remains in the water. Another plus - remote operation and remote monitoring reduce the need for constant human intervention, which in turn improves operational efficiency.

Energy savings of more than 30%

With the use of screw blower technology for the pneumatic transport of fish feed, the Chilean aquaculture company is breaking new ground and leading the sector towards a more sustainable future. The AERZEN Delta Hybrid enables considerable savings - both in terms of investment and operating costs. They reduce the carbon footprint, support compliance with ESG requirements (Environmental, Social & Governance) and reduce the size of supplemental equipment such as diesel generators, VFDs or aftercoolers. They also allow a significant increase in production output while maintaining the same level of energy consumption. Thanks to the exceptional energy efficiency of AERZEN's screw blowers at the Chil-



Aquaculture is designated as the controlled breeding and keeping of organisms living in water, e.g. fish, mussels, crabs and algae.

Photo: Shutterstock

The Chilean salmon producer uses six Delta Hybrid D13S for the pneumatic transport of fish feed. The screw blowers from AERZEN provide 100% oil-, absorbent- and PFAS-free process air highly efficiently and enable significant cost reductions while increasing productivity at the same time.

The intelligent AERtronic package control system efficiently controls the screw blowers.

ean salmon farm, two additional production feed lines could be added to the process without increasing the previous demand for electricity.

All in all, the fish company has achieved energy savings of more than 30% and a reduction in CO_2 emissions of 174 tonnes by switching from conventional positive displacement blowers to AERZEN screw blowers for a complete feeding cycle in seawater (16 months) and a medium-sized feeding vessel with six feeding lines. This represents a saving of USD 60,000 per cycle. Added to this are fuel (diesel) savings amounting to 64,800 litres of diesel.

On course for the future - for greater efficiency and sustainability

Maximised performance, minimised costs, long-term sustainability: the AERZEN Delta Hybrid has passed its baptism of fire in marine aquaculture with flying colours and will certainly be found frequently in this application in the future. "The pneumatic transport of fish feed with the Delta Hybrid D13S contributes to the continued success of Chile's dynamic salmon farming industry. We are determined to promote this highly productive sector in Chile in a sustainable manner by anticipating and actively contributing to the expected growth," emphasises César Marin, General Manager of AERZEN Chile.

Further information

https://www.aerzen.com/product/screw-blowers-delta-hybrid

https://www.aerzen.com/applications/pneumatic-transport-for-bulk-material-handling

https://www.aerzen.com/products/modifications-and-accessories

https://www.aerzen.com/applications/pneumatic-transport-for-bulk-material-handling/safety

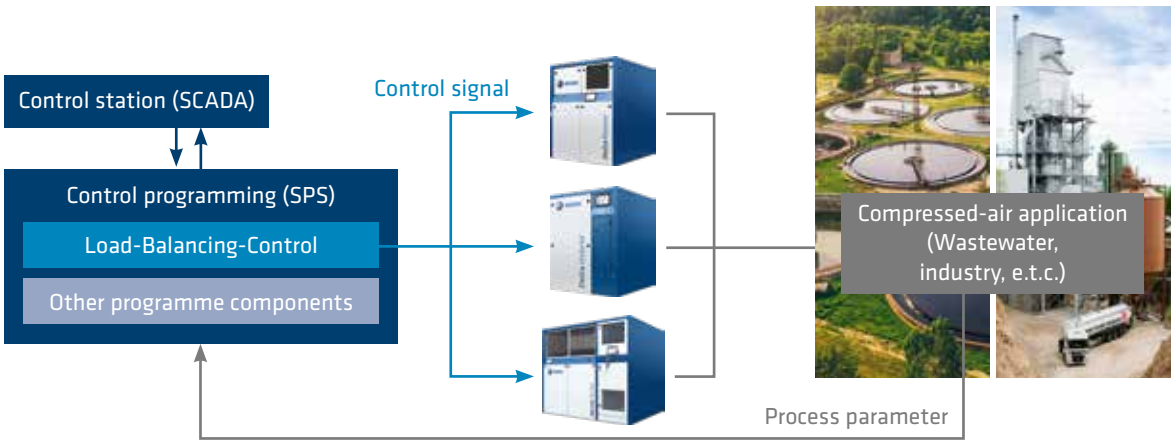
https://www.aerzen.com/products/control-technology/aertronic-unit-control

In line with the kiln furnace

Köhler Kalk GmbH: significant energy savings in the combustion air range thanks to the new **AERZEN** Load Balancing Control

Three AERZEN Delta Hybrid screw blowers provide the combustion air for the direct current counter-current regenerative kiln furnace at the dolomite lime manufacturer Köhler Kalk in Northern Hesse. For the most efficient operation of the trio of machines, the family business relies on the AERZEN Load Balancing Control (LBC) system. The intelligent control software was developed by Aerzen Digital Systems, the digitalisation specialist in the AERZEN Group, and opens up significant potential for the energy optimisation of compressed air generation - without any supplemental hardware.

Digital information
Further information on various website links and QR codes on page 21.



Load Balancing Control is an innovative software solution for the intelligent control system of several blowers and compressors in a machine network.

Köhler Kalk GmbH specialises in the extraction, processing and refinement of high-quality dolomitic lime.

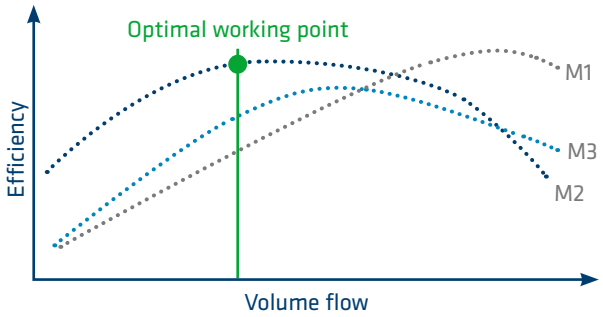
Photo: Köhler Kalk GmbH

The manufacture of lime and dolomite is extremely energy-intensive, with the burning process in particular causing high CO_2 emissions. This is because extreme temperatures of between 900 and 1,200 degrees Celsius are required to convert the raw stone into quicklime. This means that intelligent solutions which make this process more sustainable are all the more important. The Northern Hesse family business Köhler Kalk has therefore been relying for many years on an ultra-modern direct current counter-current regenerative kiln furnace and energy efficient blower technology of AERZEN. With the implementation of Load Balancing Control (LBC), Köhler Kalk has now gone a decisive step further: the intelligent control software operates the machine network, which supplies the kiln with the process air for the firing process (combustion air) at the optimum operating point at all times, thus enabling significant energy savings and process improvements.

Köhler Kalk GmbH, based in the Werra-Meißner district (Northern Hesse), specialises in the extraction, processing and refinement of high-quality dolomitic lime, a crystalline mineral mixture of calcium and magnesium carbonate. One focus is the further processing of the raw dolomite stone in the kiln to produce burnt dolomite lime. This is particularly suitable for the steel industry because the magnesium content in the dolomite has a positive effect as an oxide (MgO) during steel production and protects the converter walls when refining the raw iron into steel. In general, the added lime has the task of binding the sulphur in the melt. Steel cookers are therefore regular customers of Köhler Kalk. In addition, the fertiliser and construction industries are also supplied on a large scale.

State-of-the-art firing technology in use

The central element in the production process of dolomite burnt lime at Köhler Kalk is the direct current counter-current regenerative kiln furnace. With an efficiency of over 80%, it is one of the most energy-efficient lime burners according to BAT (best available technology, part of the plant authorisation law according to EU Directive 2010/75/EU on industrial emissions). A direct current counter-current regenerative kiln furnace consists of two to three interconnected shafts, which are operated alternately as combustion and regeneration shafts in a cycle of around 15 minutes, and works according to the principle of regenerative heat recovery: the flue gas heat is saved and used to preheat the combustion air. This reduces both fuel consumption and emissions. Köhler Kalk was the first company in Germany to burn dolomite using the direct current counter-current regenerative kiln furnace process. The ultra-modern furnace was put into service at the Vockerode location (east of Kassel) in 2017.



With Load Balancing Control, the machines always operate at the optimum energy operating point.

AERZEN screw blowers: the best of both worlds

The combustion air is supplied by three AERZEN Screw blowers of the Delta Hybrid type - two D75L with belt drive (50 kW, 4,000 m^3/h, 1,000 mbar) and one D65S with direct drive (90 kW, 3,900 m^3/h, 1,250 mbar). The innovative packages combine the advantages of blower and compressor technology in one system and stand for maximal energy efficiency with very high reliability. Compared to conventional positive displacement blowers traditionally used in kilns, significant energy savings of up to 37% can be achieved.

The supply air requirement for the firing process is not constant, but is subject to process and operation-

Photo: Köhler Kalk GmbH

View into the machine room. Three AERZEN Delta Hybrid screw blowers provide the inlet air for the firing process.

al fluctuations. In addition to the production output, it is significantly influenced by the way the direct current counter-current regenerative furnace works: the periodic switching of the air flow between the combustion and regenerative ducts leads to varying volume flow requirements. In addition, there are other influencing factors such as the quality of the fuel (e.g. calorific value or moisture content), differences in the composition of the dolomite raw brick, changing ambient conditions (outside temperature, air humidity) and the technical condition of the kiln system (soiling or wear).

The dimensions of the pipework give an idea of how high the demand for process air in direct current counter-current regenerative kiln furnaces is. Köhler Kalk put the direct current counter-current regenerative kiln furnace into operation in 2017 - making it the first company in Germany to burn dolomite using the direct current counter-current regenerative kiln furnace process.

Load Balancing Control: intelligent control software

Load Balancing Control (LBC) enables these different requirements to be met in a particularly energy-efficient manner. The software was developed by Aerzen Digital Systems, the digitalisation specialist in the AERZEN Group, specifically for the automated operation of a machine network and opens up significant potential for the energetic optimisation of compressed air generation. LBC uses models validated in the test department to optimise the operating points of each machine in the network by means of test scenarios. This means that the overall efficiency of the network can be increased without having to resort to computationally complex real-time optimisation.

At Köhler Kalk, the volume flow required for the current firing process is calculated by the master process control system of the direct current counter-current regenerative kiln furnace. The principal influencing variables (production output, operating mode, fuel quality, condition of the dolomite raw brick, outside temperature, air humidity, condition of the kiln) are all taken into account by measuring process variables such as the temperature of the

fuel or exhaust gas. The direct current counter-current regenerative kiln furnace transmits the volume flow requirement to Load Balancing Control, which calculates the load distribution between the blowers and outputs corresponding control signals for the machines. The result is a machine network that operates at its optimum energy operating point and enables the operator to realise a Return on Investment in less than 2 years.

Maximum efficiency with minimum integration effort

Load Balancing Control offers maximum flexibility and can be integrated into existing or newly created control environments with minimal effort. A customised function module is created for each customer, which is integrated directly into the system control and the existing SCADA is integrated. This saves time and costs. PLC systems from all common manufacturers are supported.

The first step is always a detailed recording and evaluation of the existing plant technology and infrastructure - the same applies to Köhler Kalk. Reconciliation was also carried out with the system integrator of the dolomitic lime manufacturer. The PLC function block was then set up, taking all system-specific parameters into account. This contains all the functions of the LBC and is conveniently provided by Aerzen Digital Systems as a download. Thanks to model-based virtual commissioning, the function module has already been preset to such an extent that only fine-tuning is required on site at the customer's premises. The system integrator implemented the function module in the control programming within a few hours by means of the documentation provided and seamlessly returned the system to productive operation.

Noise reduction as a positive side effect

The energy optimisation of compressed air generation is the central task of Load Balancing Control. But the software offers much more: it ensures that operating hours are balanced by evenly distributing the load on the machines, it avoids frequent load changes in the form of switch-on and switch-off processes and it allows individual packages to be specifically excluded from the control system.

In addition, the project at Köhler Kalk had a positive side effect in the form of a significant reduction in noise. The plant is located in the immediate vicinity of a village and there have been repeated complaints in the past due to high noise emissions. This required limiting the maximal speed of the machines, which meant that their full performance potential was not utilised. The use of Load Balancing Control made it possible to avoid interactions between the machines, which had previously led to an increase in overall noise emissions. This means that operation is now possible across the entire speed range, which also contributes to increased energy efficiency. This effect may be transferable to other systems.

Significant energy savings at Köhler Kalk

The LBC project at Köhler Kalk clearly indicates how digital intelligence, innovative blower technology and practical engineering merge into an economically and ecologically attractive solution. Thanks to AERZEN's in-house technology and targeted machine-related expertise, the machine network for combustion air supply is always operated at its optimum. As a result, Köhler Kalk was able to realise sustainable energy savings of 6 to 10%. Christian Köhler, General Manager of Köhler Kalk GmbH, is delighted: "With the new Load Balancing Control, we have not only noticeably improved the energy efficiency of our combustion air supply, but have also significantly reduced noise emissions - without any supplemental hardware. We were particularly impressed by the simple integration into our existing system control."

Rising energy prices and ambitious climate targets at both global and national level are increasingly focussing attention on energy efficiency - and making greater climate protection one of the central goals of the energy-intensive lime industry. Screw blowers from AERZEN and the intelligent Load Balancing Control software are leading compressed air supply into the future. ○

Further information

https://www.aerzen.com/products/screw-blowers

https://www.aerzen.com/product/screw-blowers-delta-hybrid

https://www.aerzen.com/product/screw-blower-delta-hybrid-direct-driven

https://www.aerzen.com/applications/cement-industry

https://www.aerzendigital.com/

https://koehlerkalk.de/

AERZEN takes off in the industrial compressed air market with ACI know-how

Complete portfolio of oil-free as well as oil- and water-injected products

Two units from AERZEN's expanded compressed air portfolio: an oil-injected screw compressor SI45 (left) and an oil-free screw compressor DS90.

Since entering the market at the Hanover Fair in April 2025, AERZEN has been in a position to cover industrial compressed air applications with a focus on 5.5 to 13 bar. The basis for this strategically important and forward-looking step is the integration of ACI – Air Center International GmbH, Oberhausen, into the AERZEN Group. "This enables us to market a complete range of oil-free as well as oil- and water-injected products," says AERZEN General Manager Klaus Peter Glöckner.

When it comes to low pressure applications up to 3.5 bar, there is no better choice worldwide than AERZEN. Low-pressure compressors are a central chapter in the company's more than 160-year history. Oil-free screw compressors have also been part of the portfolio for around 80 years - primarily as single-stage packages for process air generation up to 3.5 bar. With these specialised solutions, AERZEN is now successful in the wastewater industry (with solutions for wastewater treatment plant operation), in the pneumat-

ics industry (transport of food, minerals and cement) and in the process gas industry. However, these industries also require oil-free and oil-injected air compressors. For example, every dairy needs compressed air to keep its operations running, while cement plants and chemical companies use instrument or working air as standard. AERZEN has therefore decided to include its own compressed air solutions in its portfolio - with the clear aim of offering our customers an entire range of compressors from one single source.

Enormous impact

In order to implement the extension of our product portfolio, AERZEN has decided to acquire ACI. "This enables us to cover compressed air applications in the range from 2.5 to 40 bar, with a focus on 5.5 to 13 bar. Together, we can make an enormous impact and can expand our business sustainably," explains Klaus Peter Glöckner. In future, the ACI machines will be supplied in the AERZEN product design and will be labelled with the AERZEN logo.

"ACI provides enormous expertise and manufactures ultra-modern compressors that are outstanding in terms of energy efficiency, first-class quality and also competitively priced," says Klaus Peter Glöckner. In addition, ACI has a strong partner network for stage supply, package construction and accessory solutions that has proven itself over many years. "ACI is now the know-how provider and engineering base for our compressed-air machines," emphasises Stephan Brand, AERZEN Director of Marketing and Turbo Business.

Perfect match

The product programme and customer groups of ACI and AERZEN are a perfect match and there are no overlaps. For example, ACI offers double-stage and triple-stage oil-free compressors, with the triple-stage machines even having a unique position in the market. ACI also has specialised products and solutions in the process and compressed air range, for example for truck loading and unloading in silo vehicles or for braking systems in railway vehicles.

ACI – Air Center International GmbH was founded in 2008 by Miroslaw Gruschka. The basis for its successful development was a series of compressors developed in-house. In 2021, ACI launched oil-free compressors up to 10.5 bar, which, according to General Manager Miroslaw Gruschka, are "probably the most efficient compressors in the market." ACI is also strong in the range of small piston compressors, of which several thousand are sold each year, as well as in high-pressure compressors. Today, the company has twelve employees and has already served more than 1,000 customers in 78 countries on five continents. ACI is integrated into the AERZEN organisation as the compressed air technology product line under the management of Miroslaw Gruschka. ○

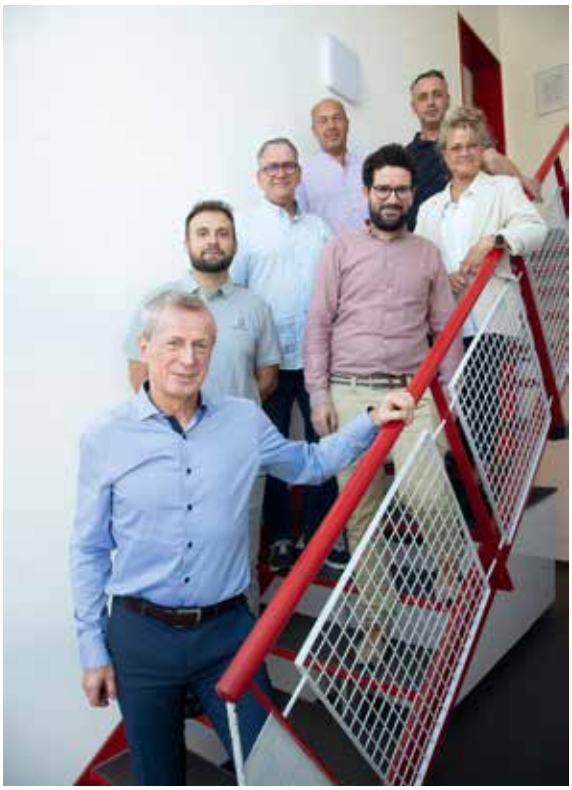


Photo: Alexandra Roth

With the ACI integration – pictured here is part of the team led by Managing Director Miroslaw Gruschka (in front) – AERZEN can now cover compressed air applications in the range from 2.5 to 40 bar, with a focus on 5.5 to 13 bar.

ACI product portfolio and scope of application

Product portfolio

- Double-stage oil-free screw compressors
- Triple-stage oil-free screw compressors
- Single-stage oil-injected screw compressors
- Double-stage oil-injected screw compressors
- Truck-mounted screw compressors
- Scroll compressors: oil-free and oil-injected
- Piston compressors: oil-free and oil-lubricated
- Extensive accessory solutions such as dryers, separators, heat exchangers and many more

Scope of application

- Fire brigade: compressors for extinguishing foam production
- Railway: brake air compressors
- Truck: screw compressor for loading and unloading
- Workshop compressors
- Compressors for drilling equipment
- Compressors for mobile construction equipment
- Construction industry: energy supply for construction equipment
- Compressors for mining
- Shipbuilding
- Agriculture
- Medical applications
- Stationary air compressors for industrial applications such as chemical and process engineering, food industry, cement and lime production

Networking brings new opportunities: **AERZEN** makes machines a digital experience

Start with the Delta Hybrid and Delta Screw series

Since mid-July, AERZEN has been supplying all machines in the Delta Hybrid and Delta Screw series with an AERtronic Premium including gateway as standard. This means that these machines are integrated directly into the AERprogress digital platform solution ex works - including transparent data transmission and remote access, but without any direct additional costs for our customers. AERZEN calls this new digital initiative “Every Machine Connectable” (EMC).

The industrial demand for solutions for remote monitoring, data transparency and remote access has been growing for years. For AERZEN customers, digital connectivity means digital connectivity more transparency in machine operation and faster access to the Group's performance and quotations for maintenance, service and spare parts.

The added value for customers is indicated in many areas:

- Online monitoring and access via cloud: the machines can be digitally monitored by the operator and accessed from remote locations.
- Transparency: operators have full insight into the condition of their machines at all times – from suction and oil temperature to oil and intake pressure to system pressure. This allows you to monitor and optimise operations in real time. All data collected is available to the operator. If the operator agrees, AERZEN can access the information if necessary and provide targeted support for remote diagnostics.
- Efficiency in service: minor interventions no longer require an AERZEN service technician on site, as many issues can be resolved by remote access.

For a surcharge, the customer can optionally activate additional tools, such as condition monitoring. Using algorithms, this tool can detect potential damage at an early stage, for example based on vibration data, motor speed or acceleration patterns. This means that unplanned downtimes can be avoided, maintenance can be planned in a targeted manner and the operational reliability of the machines can be significantly increased, while the extension can be flexibly adapted to the individual needs of the operator. Ricardo Wehrbein, General Manager Aerzen Digital Systems: "With this data and intelligent algorithms, we are further enhancing the already high machine quality of our products, sustainably increasing availability and efficiency - and thus expressing our Expect Performance vision even more strongly."

> "At the heart of our Every Machine Connectable initiative is always the improvement of our customers' experience, for example through real-time support, higher machine availability and the ability to adjust settings by remote access. The technology makes our products even more user-friendly, reliable and easier to support. At the same time, we are creating a springboard for future technologies and optimisations.
>
> **Matthew Morey,**
> Sales Director AERZEN Western Europe

AERZEN Delta Hybrid D152S at the wastewater treatment plant in Nîmes, France

Practical example from France

A practical example from Nîmes in the south of France indicates what the digital connection of AERZEN machines can actually achieve. In 2023, colleagues at Aerzen France SAS decided to use the EMC approach for certain machine types ex works. Shortly after commissioning a Delta Hybrid D152, the customer reported a problem: the machine switched off again after every start. Thanks to the digital connection, our team in Paris was able to intervene immediately by remote access. The analysis revealed that the customer's system integrator had set the VFD incorrectly, resulting in excessively long start-up times. Without having to be on site, the colleagues were able to adjust the threshold value for the oil pressure. Result: the Delta Hybrid D152 then ran perfectly and the operator was very satisfied.

Example of a VM stage with modification for vapour recompression (illustration without insulating jacket)

AERZEN compression technologies for efficient water vapour processes

Innovative technologies and growing demand characterise a dynamic market

In times of rising energy costs and growing requirements for climate protection, water vapour is increasingly coming into focus as an environmentally friendly energy source. Its versatile application possibilities, combined with innovative compression technologies from AERZEN, open up new paths to greater energy efficiency, reduced CO_2 emissions and more economical processes.

Water vapour is used in various industrial applications as an energy source for transferring heat. The natural refrigerant water (R718) is non-toxic, non-flammable, environmentally friendly and has neither ozone depletion nor greenhouse potential. Thanks to its thermodynamic properties, water is suitable as a refrigerant for high-temperature heat pumps (over 100 °C). Higher energy efficiency, reduction of CO_2 emis-

Food & Beverages	Chemicals	Pharmaceuticals	Pulp & Paper	Textile

Overview of industries with thermal processes

sions and improved plant efficiency through lower energy costs are achievable and are among the key drivers for the use of water vapour on the customer side.

There are many possible applications for water vapour. In the food industry, heat is used, among other things, for the drainage and drying of products in order to maintain their quality and extend their shelf life. The pharmaceutical and chemical industries also rely on water vapour as an energy source in process technology. The requirements for vapour pressure and temperature vary depending on the process and must be considered individually. A suitable compressor ensures a stable and reliable supply of process vapour - and at the same time opens up possibilities for energy-efficient processes such as mechanical vapour recompression.

Strong growth potential for MVR compressor packages

Mechanical vapour recompression (MVR) is an important process in many modern industries and technologies. MVR serves to increase energy efficiency and reduce environmental pollution. By reducing the use of secondary energy (oil, natural gas, coal), it also enables cost savings. In this process, exhaust vapours - in simple terms waste heat as a heat source in the form of water vapour - is compressed mechanically in one or more stages, which increases the temperature and pressure. The vapour "recycled" in this way is then fed back into the initial process or used for other purposes.

Against the backdrop of ecological and economic aspects, the global market for MVR compressor packages has strong growth potential.

With the modified VM series and the modified blower stages GM 60S to GM 240S, AERZEN offers a comprehensive product portfolio for vapour compression. The stages are water-injected. AERZEN is already active with customised solutions for vapour recompression. For a current project, slightly superheated water vapour is to be compressed in a single-stage process using modified VM85i machines. AERZEN also has many years of experience with GM blowers in the range of vapour compression in breweries, where the GM150S and GM240S types are predominantly in operation.

"SteamScrew" project

Aerzener Maschinenfabrik, in co-operation with the Fraunhofer Research Institution for Energy Infrastructures and Geotechnologies IEG and the Department of Fluid Technology at TU Dortmund University, Aerzener Maschinenfabrik is developing a high-temperature heat pump. The SteamScrew project aims to develop a high-temperature heat pump that uses water as a refrigerant. AERZEN has developed a new, synchronised water vapour screw compressor for this purpose. This allows vapour with a source temperature of 80–120 °C to be compressed to up to 200 °C and 10 bar(a) and supplied as heat or process vapour. The special design of the compressor, which enables the delivery of pure saturated vapour without contamination, should be emphasised. ○

Design of the SteamScrew stage with seals, gearbox and various connection points

Photo: Shutterstock

Boiler in the brewhouse of a brewery. The brewing process requires a high energy input and needs a constant heat supply. Boiling the wort produces water vapour (exhaust vapours), which can be recovered by mechanical recompression and reused as a heat source.

How **safe, clean and reliable** is your **process air** in sensitive areas?

The innovative solution concept

Delta Blower, Delta Screw and Delta Hybrid

- Maximum reliability and safety for demanding requirements
- Wide product portfolio individually configured to your process requirements
- 100% oil and absorbent free - guaranteed and certified
- ATEX-compliant according to directive 2014/34/EU

LET'S TALK

Torsten Lehmann
Head of Sales Offices North & East
www.aerzen.com/processtechnology

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