

# Customised and reliable solutions for process gases



**AERZEN**  
EXPECT PERFORMANCE

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# Customised and reliable processes

## AERZEN – premium in every process

Air and process gas compressing or handling are required in all key industrial sectors – also in critical or demanding areas. The operating conditions for the blowers and compressors are as varied as the applications themselves. Process gas solutions must therefore meet highly specific requirements. We know the application-specific challenges inside out and support you with bespoke engineering.

### Experienced partner to the process gas industry

AERZEN is one of the pioneers of compressor technology and is recognised as one of the most competent suppliers of technical solutions for process gas applications. When you talk to our experts about machine solutions today, you benefit from more than 160 years of expertise and experience. From an unusually broad portfolio of solutions with a consistent focus on efficiency criteria. From extremely long service lives and the internationality of a global player.

### The right plant for every application

Where gases are compressed in highly critical processes, there are only minimal tolerances. Rely on the unique expertise of a leading manufacturer in the field of compressed air and process gas handling. We develop pioneering solutions and overall concepts for over 100 countries around the world. Process gas compressors and blowers, modifications, accessories, and special developments that have proven themselves in around 2,000 blower and compressor packages installed worldwide.

Whether optimisation, modernisation or new system construction: we find the best possible solution. For your individual application. For your specific process. For all your questions.

# LET'S TALK

"...about the **bespoke accessories** for your application"

# Industrial and key applications

## Sometimes critical

## Always challenging

AERZEN offers the process gas industry an enormously wide range of blower and compressor technologies. The machines work stand-alone in all key industrial applications, in machine or container networks, onshore and offshore. They guarantee a reliable, uninterrupted, and economical production process. Under any conditions. In all applications, industries, and countries around the world.

AERZEN machines are unbeatable in terms of quality and service life and are suitable for almost all media. They impress with unconditional reliability and maximum availability, are unrivalled in terms of operating efficiency, and are individually tailored to your process conditions.

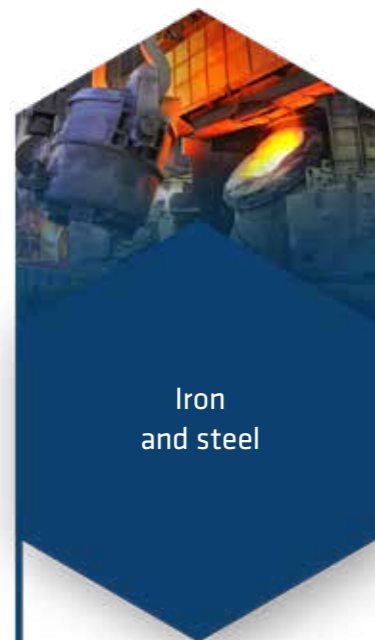
### Focus on safety and reliability

Whether chemical and petrochemical industry, refineries, energy production, oil and gas transport, industrial gas production, refrigeration industry, helium cooling and liquefaction, breweries, food and pharmaceutical industry or coking plants: The process industry often involves highly critical processes that require maximum precautions for process safety. The safety, hygiene and environmental requirements are correspondingly high.

Regardless of the type of construction, sizes, and special equipment: our machines are configured in such a way that they fulfil all relevant international regulations, building codes or specifications of the most diverse branches of industry or approval bodies. Wherever our machines are working – with AERZEN you are on the safe side.

### Maximum economic efficiency

AERZEN packages stand for low maintenance. They often run for decades and are extremely low-maintenance. This reduces downtime and saves costs. Maintenance work is planned and carried out in close co-operation with our After Sales department. With our extensive range of service and modernisation options, we can keep the service life of the machine at a consistently high level.



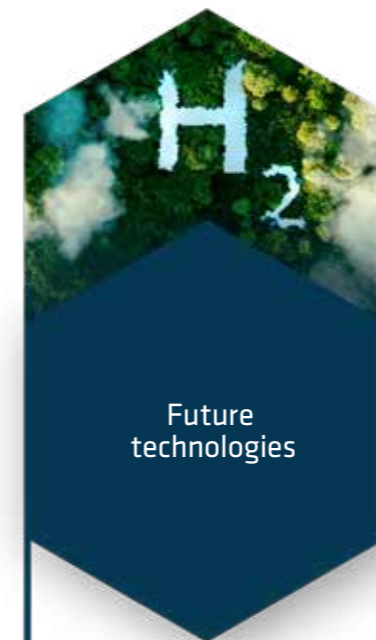
Iron  
and steel

Process and cooling gas in direct iron reduction, Blast furnace and coke oven gas compression

Downstream refinery  
PSA pressure swing adsorption  
Flare gas recovery  
Offshore



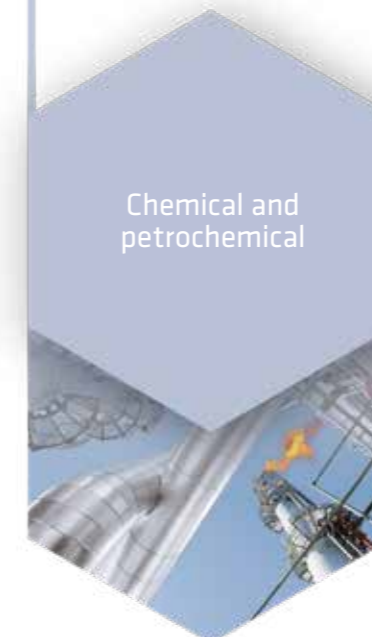
Oil  
and gas



Future  
technologies

Water electrolysis  
Green DRI (Green Steel)  
Semiconductor industry

Butadiene  
Styrene  
Soda/Sodium carbonate  
Other



Chemical and  
petrochemical



Industrial gases

Oxygen  
Refrigeration systems  
Helium/liquid gas  
Nuclear

# Engineering.

## From the application to your high-end solution

It's not the machine that determines the process – it's the process that determines the machine. This is our philosophy. Reflecting on application the AERZEN way means investing a lot of effort in preparations to understand the business of your customers. The AERZEN process gas competence centres develop high-performance solutions on this basis. State-of-the-art technologies for the most demanding process gas applications in a wide range of industries.



Oil-free screw compressor of the VR series

### Global network, local engineering

Process gas machines have to work in the most demanding applications. The requirements for performance and reliability are therefore extremely high. In order to meet these requirements, we are pooling our technical expertise in process gas competence centres in Germany, Hungary, the USA, and soon also in India.

This international network of experts with teams of excellently trained specialists forms the knowledge base for our local engineering – from design and measurement to control and electrical engineering.

### Understanding your process

Through the development of blowers and compressor technologies for around 2,000 successfully implemented process gas systems in almost all industries and applications worldwide, we have gained an enormous wealth of experience and now have an incredible depth of expertise. There is almost no application case that AERZEN has not solved. Why does AERZEN invest so much in your task? Because the performance of the machine determines the performance of the production process. Also because professionalism, experience and an eye for detail are the factors relevant to success.

### One partner. In all phases of the project

The AERZEN engineering teams accompany your system development through all project phases – from the first site inspection to long after commissioning. As your point of contact, they take over responsibility for your project in all areas of system design, from project management to quality control and system integration. Of course, this also includes the documentation and certification of the machines, as well as packaging and shipment.

One-stop-shop for your project: In this way, we ensure that you receive the best possible support – from advice, design and installation to service. Our claim: we don't just want to supply you with the best products and the highest process air quality. We also want to inspire you along the entire line.



### Engineering services from AERZEN:

- ✓ Process data calculations (drive power, cooling requirements, etc.)
- ✓ FEM analysis
- ✓ Acoustic calculations
- ✓ Torsion and lateral-critical calculations
- ✓ Design and development of assemblies
- ✓ Pipeline calculations, including earthquake calculations
- ✓ Advice on all safety issues (e.g. HAZOP studies)
- ✓ Retrofit and revamp, construction and electrical engineering, incl. MSR technology

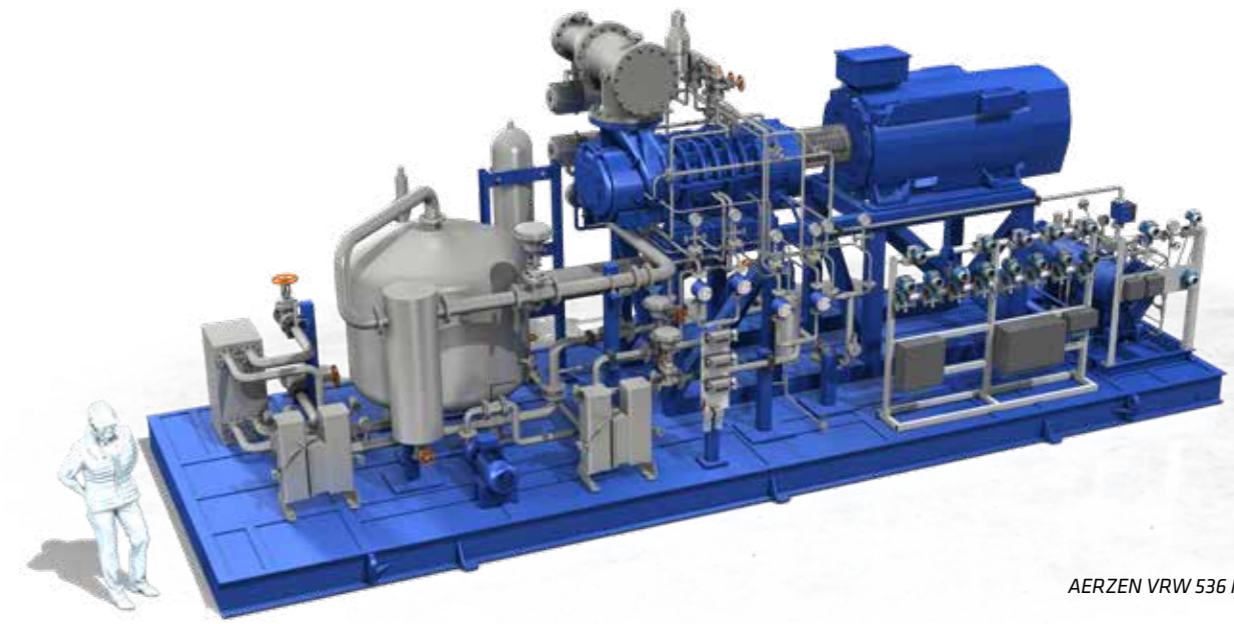
# Water-flooded screw compressor VRW

The right compressors are the key to success




Bringing large H<sub>2</sub> volume flows to intermediate and discharge pressures with just a few compressor stages without having to set up huge piston compressor systems – this is precisely where the VRW 536 M oil-free screw compressor from AERZEN comes in.

Compression is based on the principle of oil-flooded screw compressors – with a small but significant difference: the oil was replaced by water. The water serves both to cool the gas and to seal the gap, enabling compression to higher differential pressures with high efficiency.

This stage can therefore replace a two-stage system with traditional dry screw compressors, and it is even more energy efficient. This results in significant advantages for you in terms of footprint as well as investment and operating costs.



AERZEN VRW 536 M package.

|  |  |  |
|--|--|--|
|  <p>Compressor oil-free</p> |  <p>Volume flows up to 6,000 m<sup>3</sup>/h*<br/>(*Depending on the differential pressure)</p> |  <p>Differential pressure dp 3 to 9 bar</p> |
|--|--|--|

## ! Technical properties

- Water for cooling the gas and gap sealing (increased efficiency)
- Stainless steel design for maximum service life (corrosion resistance)
- Water-purged mechanical seals on the conveying chamber for 100 %
- Oil-free compression
- Designed for three-year revision cycle (MTBO)
- Oil-lubricated roller bearing for maximum speed range or volume flow range
- Speed control for adaptation to fluctuating process conditions
- Gear-synchronised rotors (no contact between the rotors)
- Directly driven or via a step-up gear

## ! Your benefits – our promise

- ✓ 100% oil-free compression
- ✓ Maximum efficiency and increased differential pressure in one stage
- ✓ Minimisation of installation area
- ✓ Reduced investment and operating costs
- ✓ Pre-drying the moist H<sub>2</sub> gas is not required
- ✓ Ideal as a pre-compressor (booster) for downstream compressor types
- ✓ Also suitable for other critical gas applications

# Oil-free screw compressor **VR**



AERZEN VRA 536 package.



Compressor oil-free

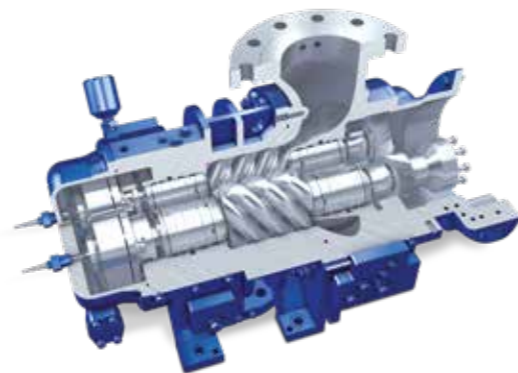


Volume flows from  
380 to 75,000 m<sup>3</sup>/h



Differential pressure dp  
1.5 to 25 bar

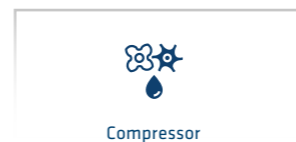
Oil-free compression for small and large volume flows, for nearly all gases: the dry screw compressors from AERZEN are extremely versatile. Gear ratios and speed controls maximise the already wide range of applications. A large number of proven sealing concepts and the fully separated oil chambers guarantee smooth continuous operation – even with dirty gases or gases that tend to polymerise. VR compressors from AERZEN are the ideal choice for fluctuating operational states and oil-incompatible gases.



# Oil-flooded screw compressor **VMY**



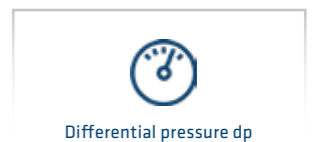
VMY 836 H package.



Compressor  
oil-flooded



Volume flows from  
190 to 23,000 m<sup>3</sup>/h



Differential pressure dp  
3 to 20 bar

The VMY oil-flooded compressors with control slide can ensure infinitely variable control of the volume flow. This can also be used as a start unloading device. The secondary rotor is not driven via timing gears (as with oil-free compressors), but via direct force transmission from the driven rotor. The oil injection quantity regulates the outlet temperature and ensures that gases with condensable components are always compressed above the specific dew point temperatures. VMY compressors are the ideal solution for gases with low molecular weights, for refrigerants, and generally for fluctuating operating conditions under high pressure ratios.



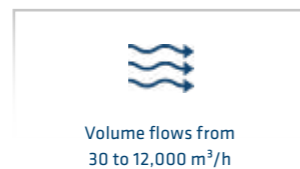
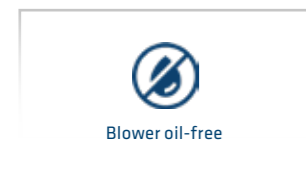
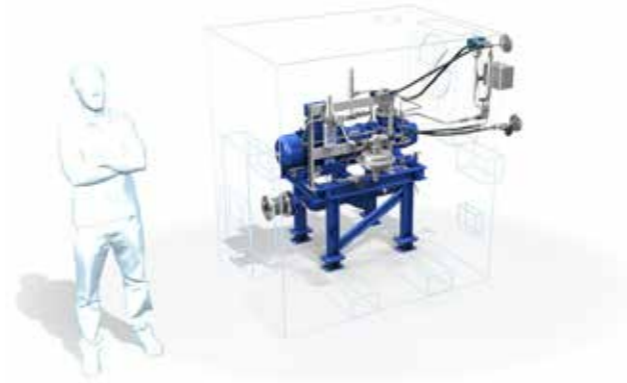
# Process gas blowers

## Two-lobe high-performance machines in oil-free design

### Blower package GMD

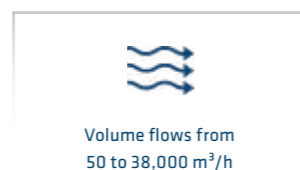
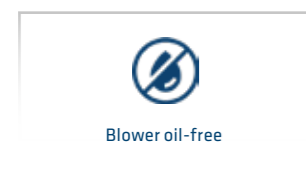
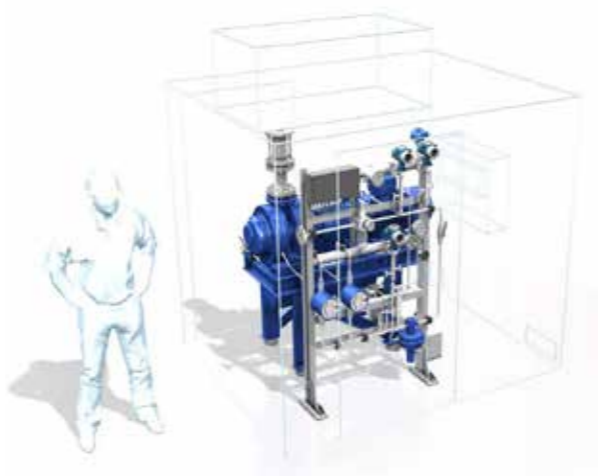
The GMD series from AERZEN is the universally applicable gas-tight booster solution for the low pressure range up to 7 bar g. The blower is equipped with a maintenance-free magnetic coupling or, alternatively, an oil-purged double-acting mechanical seal with locking system. The drive shaft seal enables a low-maintenance machine concept.

The separation between the oil and process side is effected by a special ring seal. A wide range of sizes ensures optimum operating conditions for every design case.



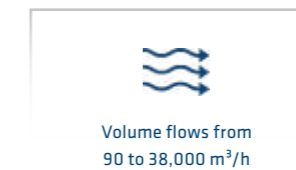
### Blower package GM-HP

The GM-HP high-pressure series was developed for gas booster applications with increased inlet pressures. For explosive gases, the design pressure of 25 bar g offers the corresponding pressure shock resistance (inner EX zone). The drive shaft seal is either maintenance-free via a magnetic coupling or traditional with an oil-purged, double-acting mechanical seal



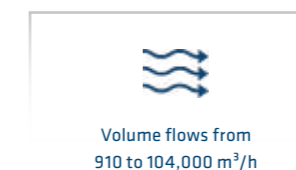
### Blower package GR

The GR series is the flexible all-rounder among the Roots blowers. This series is suitable for the oil-free handling of almost all gases for small and large volume flows. Depending on the local conditions, different sealing concepts can be selected to minimise life cycle costs. The separation of the oil chamber from the conveying chamber makes this series the optimum solution, especially for gases that are incompatible with oil. Depending on the size, the GR blower offers a pressure range of 2.5 to 6 bar g.



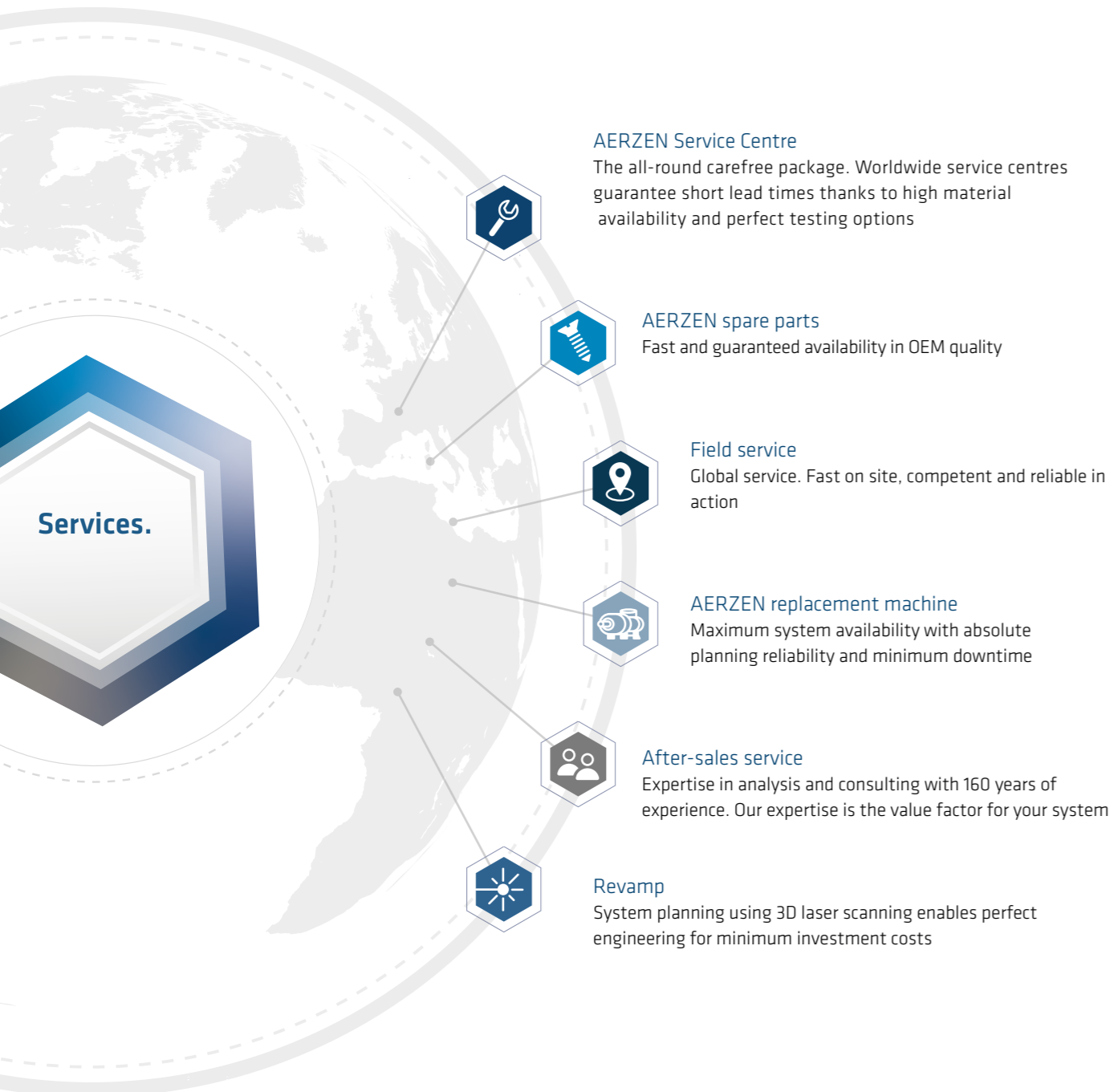
### Blower package GQ

The robust high-performance machines of the GQ series have been developed for continuous operation. The combination of an oil-purged mechanical seal with a preceding, flushable labyrinth separates the oil and conveying chamber safely and effectively over the long term. Designed for continuous operation over several years, GQ blowers are the preferred solution for process applications in iron direct reduction plants. The operating pressure range of the GQ is 2.5 to 6 bar g, depending on the size.



# Service solutions for comprehensive repairs and modernisations

AERZEN process gas machines are designed for continuous operation. If unexpected problems do occur, specially trained process gas engineers will support you around the clock. In coordination with AERZEN After Sales, spare parts deliveries, repairs, and overhauls can be prepared quickly and easily. For the highest possible availability, the best possible productivity and the longest possible service life of your AERZEN machine.



## In-house repairs at AERZEN

- Repairs at the head office in our own repair centre
- Detailed recording of findings
- Rapid retouching of components through internal manufacturing
- Quick access to spare parts thanks to our own warehouse
- Test run after all assembly work ensures the operation of each machine
- Guarantee of the highest quality through testing and documentation of all necessary requirements
- Worldwide and long-term availability of spare parts guaranteed
- Precise planning of the repair possible

## AERZEN spare parts

- Support with the selection and scheduling of spare parts
- Well-founded recommendation for critical components, which should be in stock at the customer's premises
- Definition and creation of customer-specific spare parts kits
- Our production and storage methodology helps you to plan maintenance and repairs with economically justifiable effort, and also to survive sudden emergencies

Involve us in your planning! Please contact [parts-service@aerzen.com](mailto:parts-service@aerzen.com)

## On-site service

- Rework, repairs, maintenance
- Inspection and maintenance work
- Service on all process gas machines
- Supporting the subsidiaries during staff shortages
- Workshops at the subsidiaries or on site at customer locations

Contact [field-service@aerzen.com](mailto:field-service@aerzen.com)

## AERZEN replacement machine.

- System availability
- Reduction of downtimes
- As repairs to rotating equipment always take time, it is very important – especially with critical system components – to give close consideration to this when operating a system

Please contact [parts-service@aerzen.com](mailto:parts-service@aerzen.com)

## After-sales service

- Technical support and customer training
- Vibration analyses
- After-sales service engineers in all specialist areas of mechanic and electrical engineering, measurement, control and regulation technology
- Coordination of commissioning with the service technicians

Do you need support? Then contact [service@aerzen.com](mailto:service@aerzen.com)



# AERZEN Revamp

## System planning with 3D laser scanning

Have you been a loyal customer for many years? Then you know about the high reliability and long service life of our blowers and compressors from your own experience. But even the best machines require an update from time to time. With AERZEN Revamp, this is easier than ever before.

Whether automation, efficiency improvement, speed control or upgrading the entire system to a modern standard: anything is possible with AERZEN. Depending on the requirements, a system or parts thereof can be modernised from many different perspectives with a focus on preserving what is tried and tested and/or necessary.

- Control, instrumentation or upgrade to a basic modern concept
- Realisation with the help of modern engineering and planning tools

### Retrofit made easy

Integrating new blower and compressor technology into an existing system requires precise planning and perfect engineering. Digital innovations such as virtual reality facilitate this process and are a real game changer for retrofit projects. AERZEN has been working closely with partners in the field of 3D laser measurement in system manufacturing for many years. 3D laser scanners provide perfect planning, engineering and documentation data and simplify the retrofitting and modernisation of existing systems.

### Precise measurement

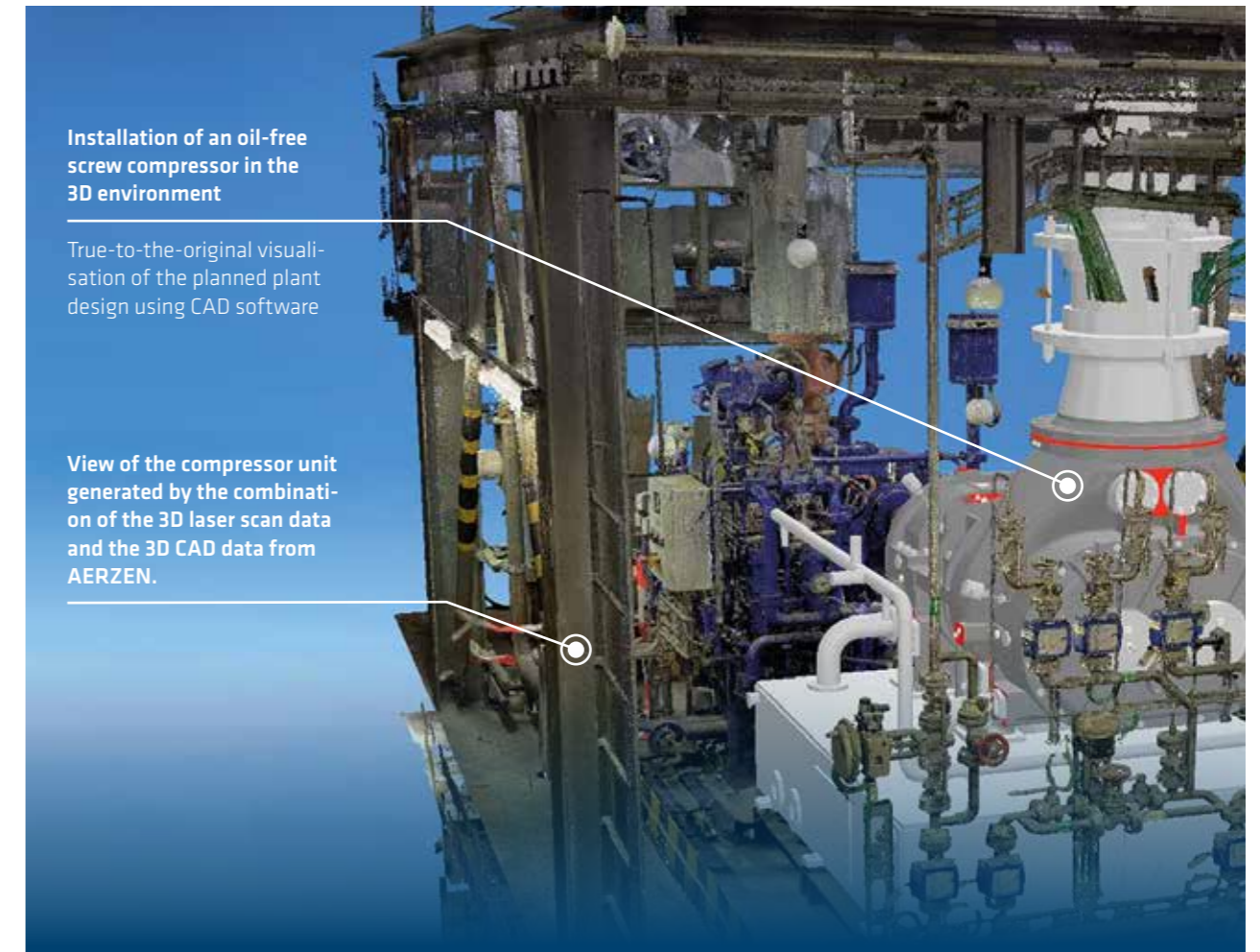
Using ultra-modern scanning technology, the plant and its surroundings are captured from various perspectives without any gaps, generating a complete 3D representation in the highest resolution and with minimal tolerance.

- Detailed recording of the existing infrastructure, supply systems as well as foundations and building parts

Thanks to the true-to-original visualisation, design engineers work directly in the customer's original environment with all actual dimensions and full transparency when converting and modernising existing systems. This guarantees absolute planning and design reliability and leads to a considerable reduction in investment costs.

### State-of-the-art control and regulation concepts

AERZEN also pays tribute to the fact that innovations in the control and regulation sector are making great strides. The portfolio includes modern control system and regulation concepts for AERZEN machines that meet today's requirements for the safety of life and limb, as well as the longevity of the machines, and which utilise the latest components from the relevant manufacturers and their standards. Based on this, old becomes new!



Installation of an oil-free screw compressor in the 3D environment

True-to-the-original visualisation of the planned plant design using CAD software

View of the compressor unit generated by the combination of the 3D laser scan data and the 3D CAD data from AERZEN.

## How you benefit: Maximum added value with minimum expenditure

- ✓ **Individual compressors and blowers are replaced within the existing package**
- **Significant reduction in investment costs!**
- ✓ The need to dismantle individual subassemblies is reduced
- ✓ Fast, complete and accurate data recording of the original environment
- ✓ Short downtimes
- ✓ Early visualisation of the target state
- ✓ Security in adhering with project goals and budgets
- ✓ Safety in design planning
- ✓ Precise and complete collision check
- ✓ Risk minimisation when installing the new unit
- ✓ Easier handling of space restrictions
- ✓ Accurate and comprehensive documentation with "as built" data for further projects and correction of inventory data



**We secure the future  
for generations.**  
by providing sustainable  
solutions for numerous  
industries such as water,  
food, process engineering,  
and renewable energies.

## **AERZEN.** Compression is the key to our success

The Aerzener Maschinenfabrik GmbH was founded in 1864. In 1868, we built Europe's first positive displacement blower. The first turbo blowers followed in 1911, the first screw compressors in 1943, and in 2010 the world's first rotary lobe compressor package. Innovations "made by AERZEN" keep driving forward the development of compressor technology. Today, AERZEN is among the world's longest established and most significant manufacturers of positive displacement blowers, rotary lobe compressors, screw compressors and turbo blowers. And among the undisputed market leaders in many areas of application.

In more than 50 subsidiaries around the world, more than 2,600 experienced employees are working hard on shaping the future of compression technology. Their technical competence, our international network of experts and the continual feedback from our customers are the basis of our success. AERZEN products and services set standards. In particular, with regard to reliability, stability of value and efficiency. Challenge us.



## **LET'S TALK**

**Find your local contact**

[www.aerzen.com/worldwide](http://www.aerzen.com/worldwide)

Aerzener Maschinenfabrik GmbH  
Reherweg 28 - 31855 Aerzen / Germany  
Phone: +49 5154 81 0 - Fax: +49 5154 81 9191  
[info@aerzen.com](mailto:info@aerzen.com) - [www.aerzen.com](http://www.aerzen.com)



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EXPECT PERFORMANCE