AERwater.

HOW MUCH WATER 4.0 IS THERE IN YOUR PLANT TODAY?
AERwater. YOUR WAY TO WATER 4.0.

AERwater is an integrated solution featuring performance modules that are finely tuned to each other. The end goal is to make your wastewater treatment plant as energy-efficient, resource-friendly, and forward-thinking as possible.

AERwater – a peerless combination
AERwater’s key feature is a close connection between hardware, software, and comprehensive service portfolio. Relying on this concentration of ‘know-how’, AERZEN has developed highly efficient aeration concepts for the wastewater market. Every wastewater treatment plant already contains the most valuable basis for this: a multitude of data from production operations.

Planning and process reliability
By transforming these data into usable information, you can shorten your decision-making processes, increase your competitiveness, and use water more sustainably. AERwater modules can be used individually or configured in any number of ways. As such, they provide valuable support for every planning stage and operational process.

AERwater guarantees efficient, sustainable water management, in the spirit of Water 4.0 - the best way to stay competitive and on the cutting edge of technology.

The strategy of Water 4.0.
Water 4.0 comes from the term Industry 4.0, and represents a forward-looking process orientation in water management. The strategy focuses on digitalisation and automation, allowing operational procedures to be organised more flexibly, sustainably, and efficiently.

Water 4.0 means better recognising the complexity of planning water management, in order to exert a decisive influence on early-warning, decision-making and production processes.

Increase productivity, reduce operating costs
AERwater means significant increases in efficiency. On average, the energy consumed during biological treatment accounts for 60% to 80% of a wastewater treatment plant’s operating costs. In this context, sustainable savings can only be realised if the efficiency of the individual machines or components is adapted to the power requirements of the plant, and the plant is monitored in real time for the exact amount of air required.
EFFICIENCY IN PRACTICE: MONITOR WASTEWATER TREATMENT PLANTS IN REAL TIME.
A TRULY CLEVER SOLUTION
THE BENEFITS OF AERWATER.

As a market leader in wastewater technology, AERZEN was developing innovative technologies long before the boost in development provided by Water 4.0. Adapting to the changes brought on by urbanisation and climate changes require a compelling solution: AERwater.

An individual efficiency solution
Based on actual load profiles (measurements of the amount of air required), the AERZEN team analyses and develops one or more solutions specifically tailored to your plant. You may choose between a variety of options from the machine technologies in AERZEN’s Performance³ portfolio.

Cost savings
Applying tailored machine technologies reduces investment costs and facilitates a rapid ROI, as the energy balance sheet resulting from the conversion generates considerable savings. Depending on the plant, Performance³ process optimisation can pay for itself within two years. AERaudit makes the savings potential of your wastewater treatment process transparent and enables you to apply for government funding programmes for energy efficiency and CO₂ reduction.

Detailed machine design and comparison.
Each wastewater treatment plant has special requirements regarding the different degrees of contamination and wastewater quantities. With Blower, Hybrid, and Turbo, AERZEN has the right portfolio for configuring machines independently of technology based on customer requirements.

Sustainable plant transparency and efficiency
AERsmart, the overriding control system, distributes the required flow requirement for light, medium, and heavy loads among the group of plants, ensuring optimal performance for your current machine configuration. As an intelligent module, it can be universally linked to the process control system. AERsmart thereby creates transparency across the total life cycle.

Service monitoring
Constant monitoring is ensured both by the overriding system (AERsmart) and the respective machine control units. Moreover, the control system can be easily expanded with the WebView module allowing operating data and service data to be retrieved from anywhere in the world at any time as required: a big step towards sustainable process reliability.

A full competence partner
As a market leader in aeration technologies for wastewater treatment plants, AERZEN offers a unique portfolio of products for this industry. But AERZEN is not just a component supplier. As an application specialist, AERZEN takes a sustainable, 360-degree perspective on the overall aeration process and customer requirements. Whether you are seeking consulting expertise at the pre-project stage, the right accessories, or customised service contracts, AERZEN supports you as a partner at all times as a single source for hardware, software, and service solutions.

From data flow to source of information: clarify your processes with Water 4.0.
HARDWARE, SOFTWARE, AND SERVICE FROM A SINGLE SOURCE.
AERZEN has responded to the challenges posed to planners and operators in the wastewater market by developing detailed modules that enable managers to quickly and cost-effectively transition towards Water 4.0. The modules are all proven to work in any type of configuration, but also, naturally, as individual services.

**WATER 4.0. MAXIMISING ADDED VALUE.**

**AERaudit**
Volume flow measurement for determining actual load profiles, analysis and reporting

**Performance³ solution**
Bespoke machine and technology design, individual ROI calculation

**Machine room optimisation**
Support for room-aeration and noise-control concepts, as well as heat recovery
**Financing**
Supporting and cooperating with external partners for government subsidies of up to 90%

**Realisation**
Support with dismantling and commissioning, rental machine portfolio

**AERsmart**
Overriding machine control for energy optimisation, networking, and data analysis

**Service 4.0**
Spare parts and service management
AERaudit. SAVINGS POTENTIAL MADE VISIBLE.

The basis for a process and energy-efficient wastewater treatment operation is a status analysis and an evaluation of current operating data. This determines the actual load requirements in order to identify saving potential. AERaudit is an innovative service from AERZEN that leads our customers to the most cost-effective and forward-thinking plant configuration in three steps.

01 | ON-SITE MEASUREMENT:

The AERZEN service team gives transparency to the numbers from your blower station. A mobile measuring station is used to record all relevant aeration data. Volume flow, system pressure, temperature, and kW rating are measured in real time and recorded in the form of load profiles.

02 | ANALYSIS:

The recorded data is analysed carefully and extensively at AERZEN headquarters. Even the smallest low and peak loads are evaluated. Based on the results, our experts develop one or more concepts tailored to your requirements, and therefore they are as efficient as possible.

03 | REPORT:

All the data from your blower station is presented transparently and in detail. Temperatures, load profiles, and energy expenditures are all visualised in the form of diagrams and explained in depth. We present you with a customised Performance³ solution including the ideal machine configuration, a report on savings potential with regards to energy and CO₂, and what ROI times might be achieved.
Biological aeration accounts for 60% to 80% of a wastewater treatment plant’s total energy requirements. Aeration therefore offers the greatest potential for savings, while also posing the biggest challenges. Large fluctuations in load profiles and varying degrees of contamination depending on the region, time of day, season, or precipitation level make supply levels highly variable. Performance³ from AERZEN represents the most efficient, high-performance, and flexible blower solution ever developed for oxygen supply. It offers customised machine configuration based on cutting-edge technologies. Let’s talk about the saving potentials in your wastewater operation.

Performance³.
Three blower technologies, one goal: maximum efficiency. Performance³ means not only the product portfolio consisting of the Delta Blower positive displacement blower, the Delta Hybrid rotary lobe compressor, and the Aerzen Turbo turbo blower, but also and especially the individual solution and the best possible interplay of technologies. Because every technology has its strengths, as well as its physical limits. For example, turbo blowers stand out from a design standpoint due to their unbeatable energy efficiency. At the same time, the control range of turbo machines is limited to between 40% and 100%, and the efficiency decreases under partial-load operation. This is where rotary piston machines really shine, however. They offer a control range of 25% to 100% and offer almost the same level of efficiency even under partial-load operation. When searching for the most efficient solution, it’s therefore necessary to configure the machine technologies to meet the individual requirements of each plant.

Whereas it used to be common practice to install blowers of just one size, today’s plants often feature a mix of different sizes or even technologies. Savings of up to 30% are possible. The AERZEN Performance³ concept offers you a customised solution based on blower, hybrid, and turbo technologies.

Faster return on investment.
Today, real efficiency means adapting the choice of blower technology precisely to the load profiles in wastewater treatment plants. That’s because every plant is different and has its own requirements. With an individual Performance³ design, you can combine the advantages of every machine technology. That means maximum energy savings with an optimal control range and minimal investment volumes. Process optimisation pays for itself within two years, depending on the plant. With our Performance³ product portfolio, consisting of Blower, Hybrid, and Turbo, we always find the most efficient and suitable solution for you.
MACHINE ROOM OPTIMISATION. CREATING THE BEST POSSIBLE CONDITIONS.

Many factors in your machine room can have a negative impact on the work behaviour of your plant. The AERZEN team draws on experience with wastewater treatment plants over the world to advise you on optimising your machine room. During implementation, AERZEN provides support by offering a broad range of solutions and accessories.

Suitable aeration is an absolute must. For your machine room, too.

Without properly sized aeration, the temperature rises significantly in the machine room. Frequency converters for rotary piston machines are another source of significant temperature increase. If the ambient temperature remains too high in the long term, the service life of your machines may be negatively affected. It is therefore crucial to regulate the climate in the machine room. What’s more, the higher the prevailing ambient temperature, the more energy has to be expended for aeration.

AERZEN is happy to advise you during your design phase to help ensure optimal working conditions in your blower station.

Effective noise insulation: the AERZEN noise-control concept.

Noise is an inevitable by-product of highly technical production operations in wastewater treatment plants. As a result, AERZEN pays special attention to machine installations in the blower station. Because blowers and compressors can be one of the main sources of noise, it pays to do a detailed study, either prior to installation by doing precise calculations or during a subsequent inspection. With the right advice, the required values can be achieved.

Use the waste heat from your machine park

The heat emitted by piping is another major factor in ensuring the best possible machine room design. The heat is caused by compression of the air that is piped towards the aeration tanks. Up to 85% of the electricity consumed is converted into heat in the airflow.

To address this problem, AERZEN offers customised solutions for heat recovery that minimise the influx of heat in the room, while simultaneously making use of the energy contained in the air.

A heat exchanger with low pressure loss allows you to use the exhaust air to heat buildings, for example, or to help with the drying of sewer sludge. By reducing the ambient temperature while simultaneously recovering heat, you can increase the efficiency of your plant and save resources at the same time. Depending on the type of machine and its performance, you could recoup the cost of installing AERZEN machines after two or three years.
FINANCING.
UTILISE GOVERNMENT FUNDING PROGRAMMES.

The energy needs for water treatment are tremendous. Wastewater treatment plants are among the biggest energy consumers in a community. Energy optimisation is therefore a burning issue addressed by diverse funding initiatives. Process optimisation and energy recovery require high-efficiency products. Use innovative technology from AERZEN for forward-thinking resource management and secure government support for your investment.

Twice as good: save and recover energy.
Designing products for secure and sustainable water management is what AERZEN does best in R&D. All the assemblies are designed to meet the strictest requirements for energy efficiency. The same goes for energy recovery, because the carefully designed product solutions can also be used to exploit waste heat. As a result, AERZEN blowers meet political goals for energy conservation and energy recovery.

The climate protection goals of the German government are supported by numerous subsidies that are available to operators of water management plants. Numerous concepts are taken into account, including ones for climate-friendly wastewater treatment, improved energy balance, and measures for producing and/or recovering energy. In general, subsidies are available for a large number of energy optimisations.

Support for subsidies.
In cooperation with the government-funded network e.qua, AERZEN offers its customers a broad range of services connected with subsidies.

<table>
<thead>
<tr>
<th>Provider</th>
<th>Service</th>
</tr>
</thead>
</table>
| AERZEN  | • Measurements of the actual airflow requirement  
|         | • AERaudit: Evaluation of your existing performance data from the compressor station  
|         | • Energy analysis and energy optimisation, as well as CO₂ calculation  
|         | • Design of an optimal compressor concept with turbo blower, rotary lobe compressor, and positive displacement blower, together with ROI calculations  
|         | • Development of heat recovery concepts with visualisation of recovered energy and reduction of CO₂ emission  
|         | • Machine house optimisation regarding concepts for room aeration and noise control |

| e.qua   | • Preliminary review of eligibility  
|         | • Pre-clarification of suitable subsidy opportunities for energy concepts  
|         | • Pre-clarification of investment subsidies  
|         | • Relaying of contact information for project sponsors  
|         | • Support for subsidy applications |
REALISATION.
SECURITY FOR YOUR OPERATION.

Often, it is not until something is implemented in practice that we recognise how important it is for everyday operations to run smoothly. The AERZEN wastewater experts have many years of experience with all the requirements of the branch. You can count on us for competent support, whether you’re looking to commission a plant, expand an old one, or rent machines on a short-term basis.

Commissioning – off to a good start.
Professional commissioning by an AERZEN service technician helps avoid errors. The new machine is integrated into your production operation from both a mechanical and electrical standpoint. As a result, all the potential hazards resulting from improper commissioning are avoided and a foundation is laid that will ensure the durability of the machine. In particular, the customer’s job specifications are followed precisely when starting machines and integrating them in the process control system, taking into consideration start-up and shut-down processes.

Rental service – short-term use of machines or accessories.
Should a machine break down, AERZEN is available 24/7 with a broad portfolio of machines for short-term use. In this way, bottlenecks can be bypassed and process reliability can be ensured. If you want to rent machines to determine the actual air requirements for the base load and during peak demand, we can make these available to you as well. AERZEN also provides its rental service as a complete turnkey service, including transport, installation, commissioning, and maintenance contracts.
AERsmart.
NEEDS-BASED CONTROL OF CHANGING LOADS.

With AERsmart, the overriding control system for the device group, you can perfect the performance behaviour of Performance³ even further. The software ensures that the air volumes are optimally allocated to the corresponding technologies and their individual efficiencies. This makes it possible to achieve outstanding efficiency levels that can closely approximate the hypothetically possible ideal value. What’s more, AERsmart can reduce energy expenditure by up to 15%.

Efficient even with rapidly changing loads
Loads in biological wastewater treatment plants can fluctuate greatly. Changes are often sudden and make it difficult to set blower stages in a way that optimises energy consumption. AERsmart has provided an intelligent solution for this challenge. Our innovative machine control system allocates the required volume flow to all assemblies connected to the system. In this way, light, medium, and heavy loads can be managed efficiently, resulting in the best possible configuration for any plant combination. Performance ranges and efficiencies are factored into the algorithm used by the control system.

Automatic control system for up to 12 machines
AERsmart ensures the reliable administration of control management and rules for a given compressor group, applying the optimal technology for the current predominant load operation, and allowing opportunities for energy conservation to be effectively exploited. The combined operation of various blower stages - controlled by AERsmart - takes efficiency in aeration tanks to a new level. It is also possible for third-party equipment and installations with just one machine technology to be operated via AERsmart.

AERsmart also allows for the integration of third-party equipment.
SERVICE 4.0. OUR PRESENCE IS OUR STRENGTH.

In the service world, too, AERZEN is ideally positioned to face the future, with modern process monitoring and individual service offers tailored to each production operation and every stage of our products’ lifecycles. Outstanding logistical coordination and rapid, reliable provision of spare parts are also typical at AERZEN. Service 4.0 from AERZEN distinguishes itself in its unparalleled commitment to service.

Rapid and skilled – workflow at the AERZEN Service Centre
At the AERZEN Service Centre, everything is geared towards efficiency, so that the time between acceptance and final inspection or delivery of a machine remains as short as possible. This includes an extensive supply of standard parts that is constantly being updated. Dedicated cleaning and painting facilities and a test bench are also integrated in the Service Centre. A digitally operated lift system carries each required spare part almost instantly to the repair workstation that needs it.

The seamless integration of each service process enables a lead time of just a few days for the manufacturing of AERZEN blower and compressor stages.

Process monitoring with AERZEN WebView
Both AERsmart group control and individual assembly control can be integrated in the customer’s network via a multitude of interfaces. In particular, AERZEN’s WebView module ensures a high level of transparency and process reliability. All service data, from maintenance notifications to spare part requirements, can be retrieved via any Web-enabled mobile device anywhere in the world at any time.

Warning and error notifications are instantly forwarded via e-mail to critical personnel, so that potential breakdowns can be resolved immediately.

AERZEN WebView complies with the forward-thinking process design of Water 4.0 and addresses customers’ expanding expectations for monitoring. The interface is user-friendly and intuitive to use. All process data is stored securely on an SD card integrated in a Web server module and can be evaluated by the company. Upon explicit authorisation, the AERZEN service team can provide support via remote access.

AERZEN WebView can be integrated retroactively into the control system technology. No App is needed to use it, only a browser that supports HTML5.

Other AERZEN services:
- Genuine spare parts
- Service kits
- AERZEN oils and lubricants
- Individual service agreements
- Machine diagnostics
- Motor-greasing and regreasing devices
- Exchange stages
- Noise-control optimisation
- Training courses/training centre
LET’S TALK
Markus Leidinger, Application Specialist, Wastewater Technology
+49 175 9335602  markus.leidinger@aerzener.de