AERZEN

TURBO BLOWERS

The New Generation 5 Turbo Blower Units from Aerzen
Volume Flow Intakes from 4,000 m³/h to 13,200 m³/h

AERZENER MASCHINENFABRIK GMBH

T1-020 | 00 | EN
3000 4.2012

Technology from Aerzen.
Always one step ahead.

The new performance class:
Aerzen Turbo Generation 5

Developed especially for high intake volume flows of between 4,000 m³/h and 13,200 m³/h, the Generation 5 turbo blowers from Aerzen are setting new standards for performance and economy in waste water treatment. The frequency-controlled and oil-free turbos are state-of-the-art in compressor technology – with decisive advantages in their application. This innovative technology is the perfect complement to the Aerzen portfolio, a technology mix that promises increased efficiency in industrial and municipal waste water treatment.


AERZEN

High volume flows have always been a challenge. But then, there was never a technology like this to handle them.

The problems of rising energy costs and ecological challenges have placed a great deal of pressure on politicians, researchers, and users alike. Energy efficiency is today's megatrend. That is where the greatest amount of energy is needed, is where the need to act is most pressing. But that is also where the greatest potential savings are to be found. And why it is worthwhile for sewage plants to rely on technologies that focus on reducing energy costs to increase efficiency.

The new efficiency in aeration basins
60 to 80% of a biological sewage plant's energy is used in the aeration basins. These numbers are compelling: every percentage point counts when it comes to reducing energy consumption and associated costs. That is why Aerzen developed the new Turbo Generation 5. With its perfect integration of high-performance components, this innovative turbo machine can achieve up to 30% in energy savings, making it the top of its class when it comes to economy.

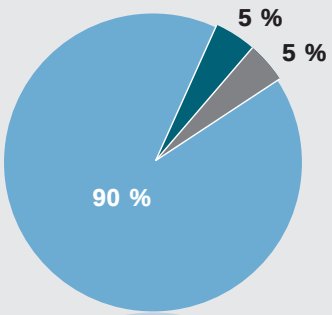
Consistently low life-cycle costs
Investment in energy efficiency is an investment in the future – and this investment has to pay off. That is why the new Aerzen Turbo generation was especially designed to minimize life-cycle costs. This means not just minimal energy consumption, but also reduced maintenance costs.

Using lost heat intelligently
A unique feature of the Aerzen Turbo: waste heat is not simply vented into the environment, but is stored in a separate flange for later use. The "intelligent" side effects of this: cooler working spaces, no unnecessary warming of the aeration basins, and free heat where you want it.

Non-stop operation
Maximum reliability during non-stop operation is one of the quality features in Aerzen compressor systems. You can rely on this with the new Generation 5 turbo blowers as well, particularly because their air foil bearings do not need lubrication and are practically friction and vibration-free.

Easily installed, immediately functional
Compact in design and light in weight, the Aerzen Turbo Generation 5 can be easily installed side by side to save room – in new facilities, as additions to or replacements for other compressors. Getting started is just as easy: the Turbo is delivered turnkey-ready from the factory.

Typical cost breakdown for Turbo Generation 5



Average operating costs over 10 years for a turbo blower:

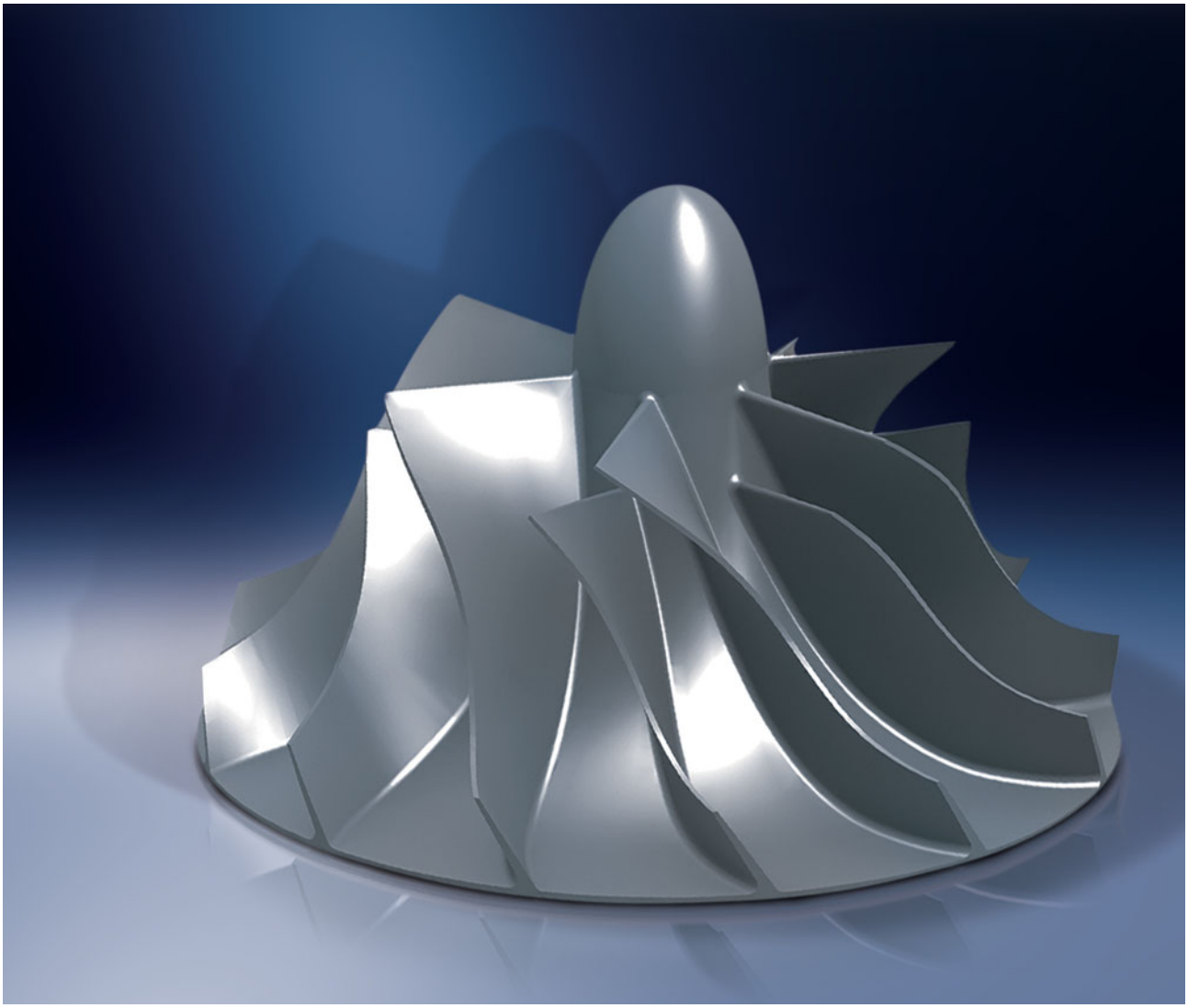
- Energy
- Investment
- Maintenance

Plusses for waste water treatment
- Maximized performance and energy efficiency for high volume flows
- Reduced life-cycle costs
- Low unit noise levels
- Reliable operation
- Durable high-tech components
- Reduced maintenance and service costs
- Space-saving side-by-side configuration
- Easy to operate and install
- User-friendly
- Recyclable waste heat

Maximum performance requires functional technology – and perfectly attuned components.

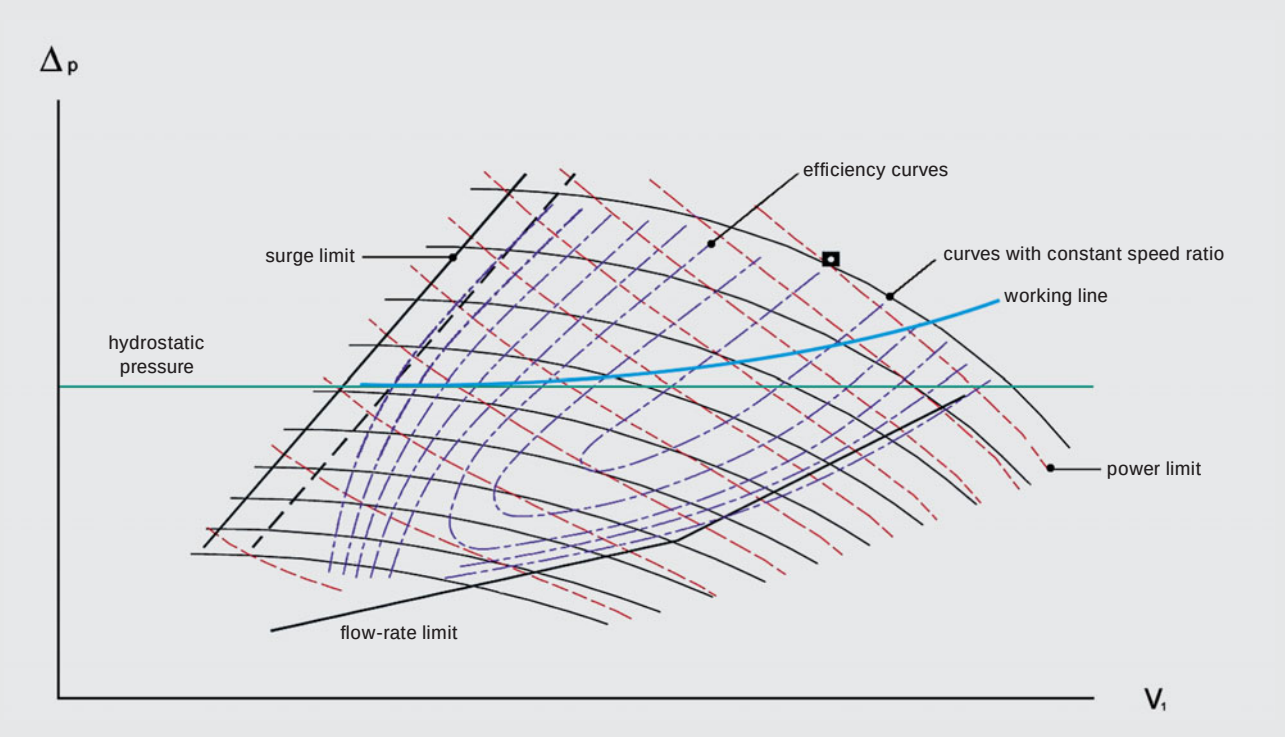
All Aerzen products are manufactured in the company's own plants. The advantage is obvious: all components can be perfectly attuned to one another and fully integrated into the production process. The result is greater reliability, safety, and economy. Round-the-clock, uninterrupted operation. And maximum productivity at reduced costs.

Optimal efficiency guaranteed:
The stainless steel impeller
The Aerzen Turbo Generation 5 is the only turbo blower with a stainless steel impeller. This material allows for noticeably better aerodynamics, resulting in higher levels of efficiency. In addition, stainless steel is corrosion-resistant and extremely robust – another plus for keeping costs down. The three-dimensional design fits perfectly into the working part of the machine. The foundation for the extraordinary efficiency and durability of the Generation 5 turbo blowers.



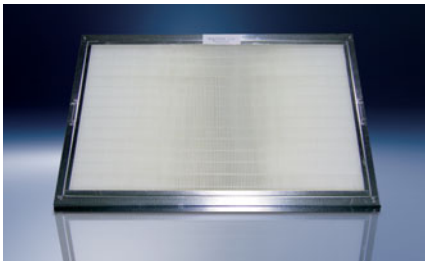
Impeller

Intelligent security:
The integrated frequency inverter
The frequency inverter maintains turbo performance levels at between 40 and 100%, depending on fluctuating oxygen requirements. And this without the need for mechanical controls. In addition, it prevents the blower from falling below surge as a result of unexpected pressure fluctuations by constantly monitoring volume flows. The Aerzen Turbo's integrated frequency inverter was designed especially for the safe and efficient operation of the turbo blower. Compared to standard inverters, it is a giant step forward in performance and effectiveness.

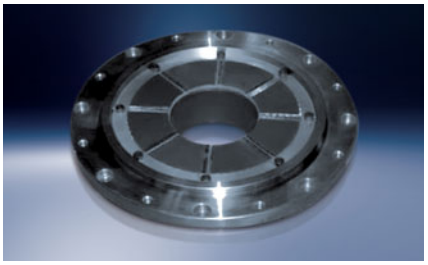


Driven by efficiency: the Aerzen PM motor
An innovation that is setting standards: the Aerzen permanent-magnet motor is noticeably more efficient than conventional motors. In this air-cooled motor, electromagnetism is combined with the rotor's permanent magnet, which is why the rotor requires no additional power to magnetize. One of the reasons for the exceptional performance and high efficiency levels of this generation of innovative motors.

Completely oil-free:
The aerodynamic air-foil bearings
The Aerzen Turbo operation is low-friction, low-maintenance, and completely oil-free because the turbo impeller is mounted directly onto the motor shaft. When stopped the shaft rests on a coil-mounted membrane. Immediately after startup, the rotation creates a cushion of air between the membrane and the shaft. This aerodynamic air-foil bearing guarantees friction and vibration-free operation, without the need for lubrication. Turbo blower and motor are exclusively air-cooled.



Air filter



Air foil bearing

Permanent magnet motor

Turn-key ready – the delivery package:

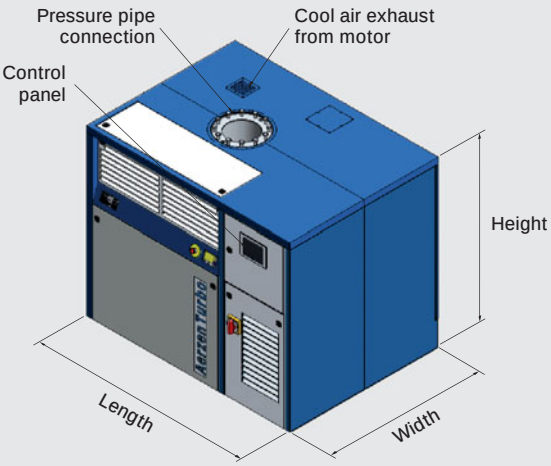
- Turbo blower with innovative high-speed, highly efficient PM motor
- Integrated frequency inverter for automatic volume flow regulation
- Power choke with integrated RFI filter
- Integrated touchscreen control
- Compact, space-saving acoustic hood (side-by-side installation)
- Drawer-type design for all electronic components
- Intake filter
- Pressure relief valve
- Main switch
- Intake silencer

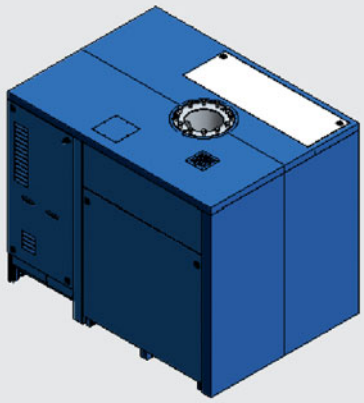
Rounding out the picture: standard accessories

- 90° pipe elbow for horizontal conduits
- Corrugated pipe compensator with guide tube and length limiter
- Pressure loss-optimized non-return flap, suitable for use on the inverter
- Absorption discharge silencer to reduce noise in the pressure pipe, calibrated and manufactured according to pressure device guidelines 97/23/EG
- Optional pipe/channel intake

Modifications and extensions:

- Primary control for combined operation of multiple blowers
- Master control for two units
- Profibus DP Net

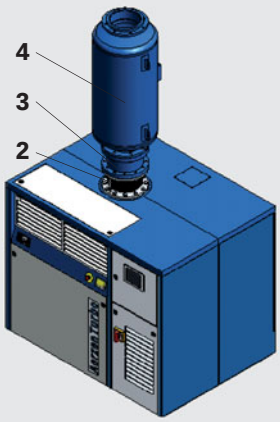




Blower size	Specifications				Dimensions and Weights				
	Pressure max. mbar	Volume Flow max. m³/h	Motor Output max. kW	Noise Pressure Level max. dB(A)	Length mm	Width mm	Height mm	DN	Weight kg
AT 150-0.6 S-G5	600	6300	112	<80	1855	1435	1501	300	750
AT 150-0.8 S-G5	800	4800	112	<80	1855	1435	1501	250	650
AT 150-1.0 S-G5	1000	4140	112	<80	1855	1435	1501	250	660
AT 200-0.6 T-G5	600	8400	150	<80	2450	2140	2105	400	925
AT 200-0.8 S-G5	800	6480	150	<80	1855	1435	1501	300	765
AT 200-1.0 S-G5	1000	5340	150	<80	1855	1435	1501	250	665
AT 300-0.6 T-G5	600	12600	225	<80	2450	2140	2105	500	1085
AT 300-0.8 T-G5	800	9660	225	<80	2540	2140	2105	400	1095
AT 300-1.0 T-G5	1000	8280	225	<80	2450	2140	2105	400	990
AT 400-0.8 T-G5	800	13200	300	<80	2540	2140	2105	500	1090
AT 400-1.0 T-G5	1000	10680	300	<80	2450	2140	2105	400	1045

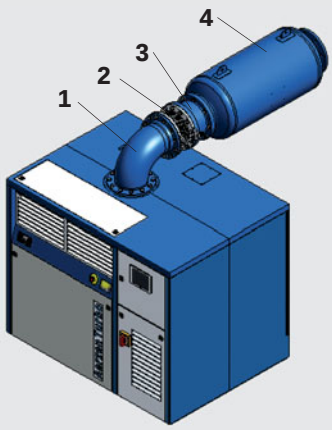
Standard AT Turbo accessories

Basic unit with standard accessories



RFS option for the AT Turbo

Basic unit with standard accessories and optional flange pipe elbow



1 90° Pipe Elbow
2 Compensator
3 Non-return Flap
4 Discharge Silencer

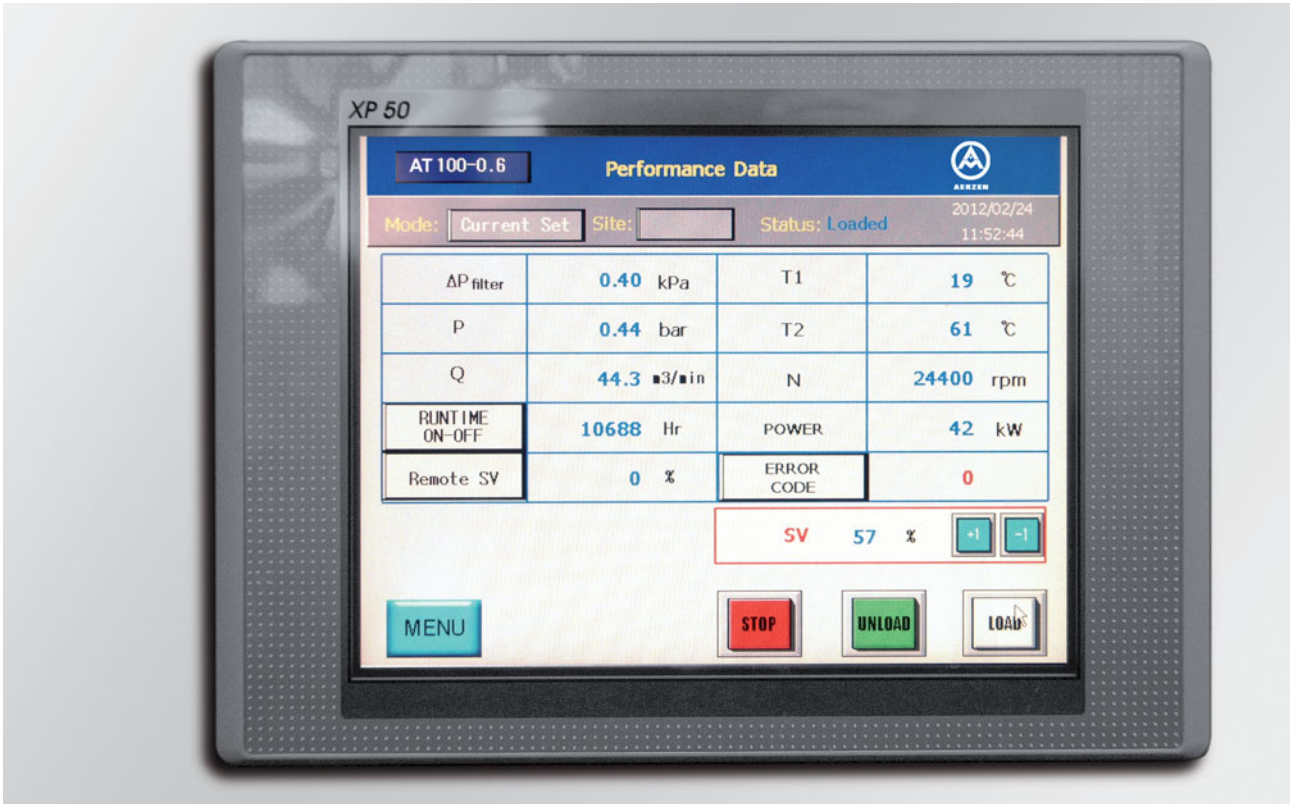
Today's turbo technology is highly intelligent – and efficiently controlled.

The increased energy efficiency of high-performance technologies is a product of increasingly intelligent design. But equally important for today's high-performance technologies is that they be run at optimal levels. The Aerzen Turbo Generation 5 achieves this with its high-tech control and operating systems. Right on the mark no matter what the load.

Intuitive and comfortable – the Turbo control system
The integrated electronic control system was developed to make running the high-performance Turbo as dynamic and comfortable as possible. The control panel is an intuitive touch screen on the front door of the unit. All operating data can be displayed and parameters easily changed with the user-friendly menu structure.

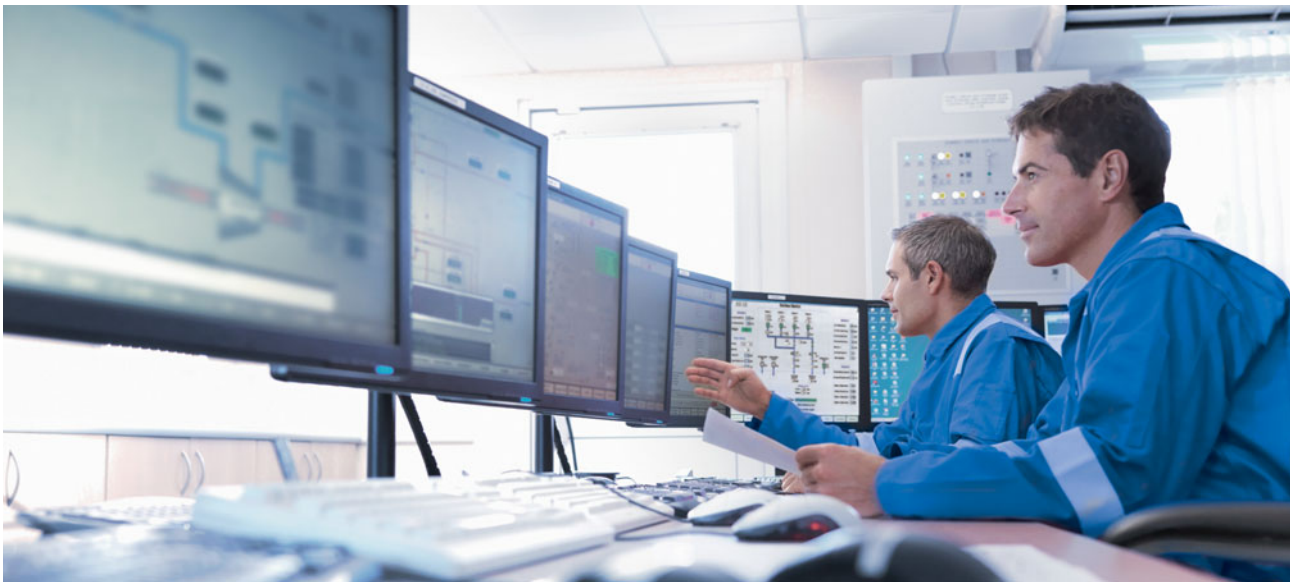
On-screen performance data:
Intake filter pressure differential, differential pressure, volume flow, intake temperature, end temperature, RPM, electrical power, hours in operation, error codes: The turbo blower performance characteristics are completely integrated into the control system with all permissible min. and max. values (surge, max. RPM, overload, et cetera) and displayed during operation. Performance data are displayed on screen.

Decisive advantages – point by point
- Integrated control system
- Intuitive touch-screen commands
- Efficient basic functionalities
- Modular expansion as needed via profibus interface
- Turbo blower control possible with the following parameters: intake volume flow, discharge pressure motor flow, analog signal 4…20 mA from the plant-side control system



Functional options: The more, the better.

The opportunity to support you, the plant operator, means that we go beyond simply providing high-performance technical solutions. It means that we also place our wealth of experience at your disposal, 24 hours every day, 7 days a week.



Our idea of service: 24/7, worldwide
Over 1,800 employees in more than 40 subsidiaries worldwide, representatives in over 100 countries, and more than 100 service mechanics on all continents – wherever you are we speak your language and can be there when you need us.

More than just technology: our application know-how
145 years of company history, with over 20,000 individually configured solutions for sewage treatment plants in the past 10 years alone. The vast application know-how behind the Aerzen Turbo Generation 5 is just as unique as the wide variety of technologies and devices that it produced. For you the plant operator it means the security of having Aerzen guide you to just the right solution at just the right price.

Aerzen – a tradition of innovation
Founded in 1864, Aerzener Maschinenfabrik is counted among the pioneers in compressor technology, and has become one of the world's leading manufacturers. Aerzen's active R&D department produces a steady flow of pioneering innovations that set standards for technological progress. No wonder the company motto is "Always a step ahead."

Pioneering technology means high-performance components – and perfectly integrated system solutions.

Various technologies have to be considered to find the right solution for every application in waste water treatment. This means primarily turbo blowers, rotary lobe blowers, and rotary lobe compressors. And a combination of these high-performance technologies is ideal for maximizing energy efficiency. Assuming, of course, that they are perfectly attuned to one another.

Unique: The variety of technologies available for waste water treatment

In over 145 years of experience in the development and manufacture of efficient compressor technologies, Aerzen has produced a range of products unequalled in its depth and breadth. The wide variety of technologies that the company has developed for waste water treatment is unique as well: the Aerzen Turbo Generation 5 blower, the rotary lobe Delta Blower, and the Delta Hybrid rotary lobe compressor. With the wide range of models available, these three technologies can be tailored to any kind of plant requirements. In addition, their functionalities are perfectly attuned to one another, meaning they can be used in any combination. After all, Aerzen manufactures all core components in it own facilities, from the control system on up. This is your guarantee for optimally integrated system design, one that stands for maximum reliability and maximum economy.

The best of both worlds: Delta Hybrid

The world's first rotary lobe compressor is a synergy of blower and compressor technology that combines the advantages of both systems along with completely new ways of producing overpressures and vacuums. With its 7 patents and patent applications, the Delta Hybrid is one of today's most innovative products in compressor technology. The design is based on the successful Delta Blower and Delta Screw lines and is being further developed on an ongoing basis.

Delta Hybrid	
Available volume flows:	670 to 5,900 m³/h
Pressure range:	100 to 1,500 mbar
Control range:	25 % to 100 %

A broad range of applications:
the Delta Blower Generation 5

The Delta Blower Generation 5 synthesizes the widely-used compact units from Aerzen with new technologies. Generation 5 stands not only for the fifth generation of rotary lobe blowers from Aerzen, but also for five important advantages for the customer:

- Quieter through significant noise reduction
- Easier to operate
- Lower energy consumption through IE3 motors
- Easier to maintain, no absorption material
- Smaller, space-saving design

These are the outstanding qualities that put the Delta Blower Generation 5 series from Aerzen way ahead of other blower models.

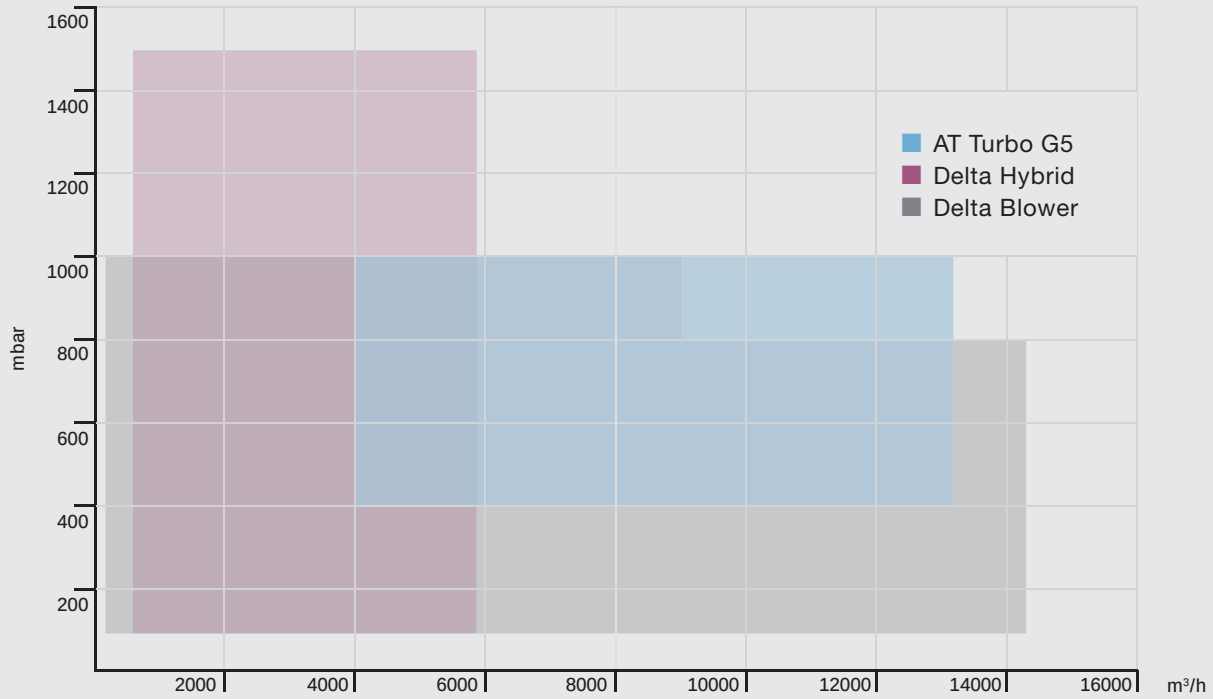
Delta Blower Generation 5	
Available volume flows:	100 to 14,400 m³/h
Pressure range:	100 to 1,000 mbar
Control range:	25 % to 100 %

Aerzen Turbo Generation 5	
Available volume flows:	4,000 to 13,200 m³/h
Pressure range:	400 to 1,000 mbar
Control range:	40 % to 100 %

You'll find the most economical system combination through detailed profitability calculations. And you'll also find it at Aerzen.

Biological sewage treatment plant operation is characterized by wide load swings. The amount of waste water to be treated – and its level of pollution – will change depending on region, time of day, day of the week, season, or amount of rainfall – often without notice. Operators who want to run their plants at peak efficiency will benefit from the advantages of combining different compressor systems to fit their individual needs.

Compressor technologies for waste water treatment



How to optimize energy savings potential

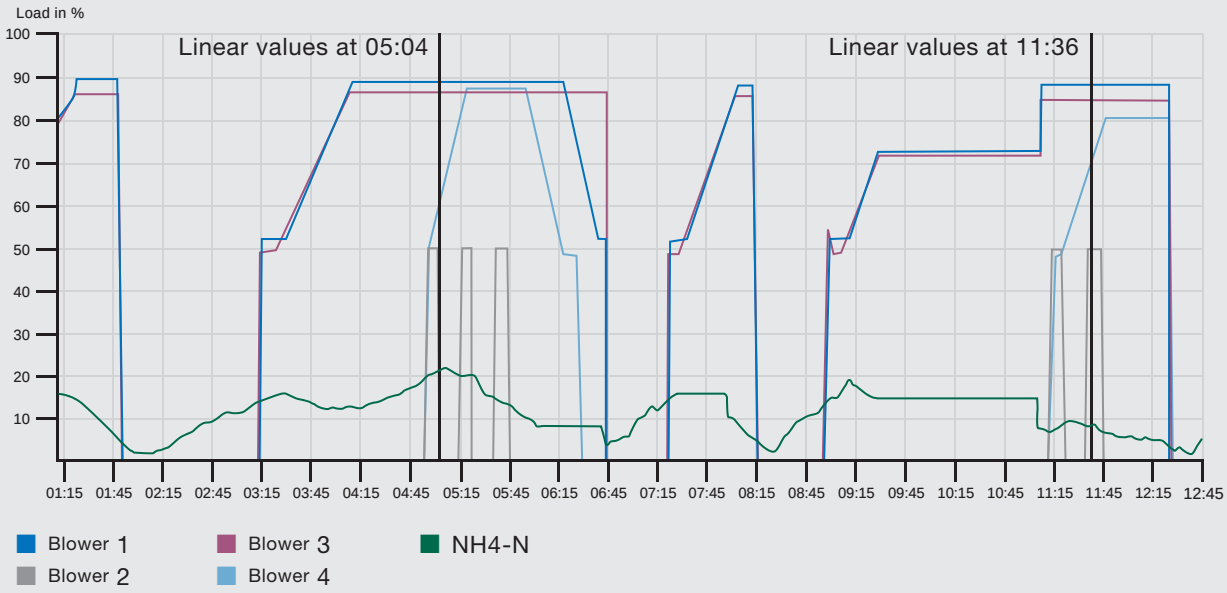
Whether in industrial or municipal operations, truly efficient aeration processes in today's treatment plants can be achieved only by combining different types of equipment with different performance characteristics. Engineering departments of all kinds have demonstrated this. Which combination is the best can only be determined on a case-by-case basis. Energy savings potential can best be realized only when: (1) the preferred design takes a sufficiently broad performance range into account, and (2) the mix of baseline and peak load systems needed to meet the requirements can be activated automatically.

Which technology to use
The Aerzen portfolio offers a broad range of technologies for optimal oil-free solutions to oxygenating aeration basins. All from the same manufacturer.

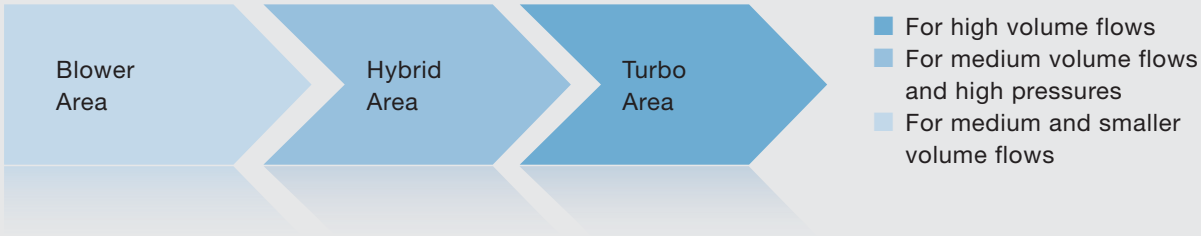
Possible configurations:
For baseline loads
(1) Aerzen Turbo Generation 5, the frequency-controlled turbo blower from Aerzen.

For peak or weak loads
(2) Delta Blower Generation 5, the frequency-controlled rotary-lobe blower from Aerzen.
(3) Delta Hybrid, the frequency-controlled rotary-lobe compressor from Aerzen.

Load variations in a sewage treatment plant



Optimal design of an energy efficient system combination



Aerzen Turbo Generation 5.
The new performance class in detail.

- **The new generation of high-performance turbo blowers for high volume flows of between 4,000 and 13,200 m³/h**
- **Innovative high-tech components for optimal energy efficiency in wastewater treatment**
- **Factory-delivered ready-to-run “all-in” configuration**
- **Individualized, single-provider system combination for maximized energy efficiency**
- **Worldwide sales and service network**

Aerzener Maschinenfabrik GmbH
Reherweg 28 · 31855 Aerzen / Germany – POB 1163 · 31849 Aerzen / Germany
Phone: +49 51 54 / 8 10 · Fax: +49 51 54 / 81 91 91 · www.aerzen.com · info@aerzener.de