TURBO BLOWER

AERZEN TURBO BLOWER UNITS TB

Intake volume flows from 300 m³/h to 6000 m³/h

AERZEN

TECHNOLOGY FROM AERZEN. ALWAYS ONE INNOVATION AHEAD.

In today's world of hard-fought markets and ever increasing competition, it is rare to find a company with over 150 years of continuous operation. AERZEN is one of those. For generations this family enterprise has stood for quality and innovation. AERZEN's latest innovation – TB Turbo blowers for wastewater treatment – is one more proof of this: amazing performance that sets new standards for energy efficiency.

AERZEN – a tradition of forward thinking

Founded in 1864, Aerzener Maschinenfabrik is a leader in today's compressor technology. Its rotary lobe blowers and screw compressors have been important elements in many manufacturing sectors for decades.

AERZEN's active R&D department produces a steady flow of pioneering innovations such as the first rotary lobe compressors worldwide, Delta Hybrid, products that have become hallmarks of technological progress. "expect performance" as the company motto says.

Saving Energy – Saving the future

The problem of rising energy costs coupled with dwindling resources is worrying managers, researchers and consumers more than ever before. The demands on the technologies of the future – peak performance at minimal energy consumption – are incredibly high. Added to this is the growing problem of resource shortfalls. The highest energy costs are found in basic industrial processes:

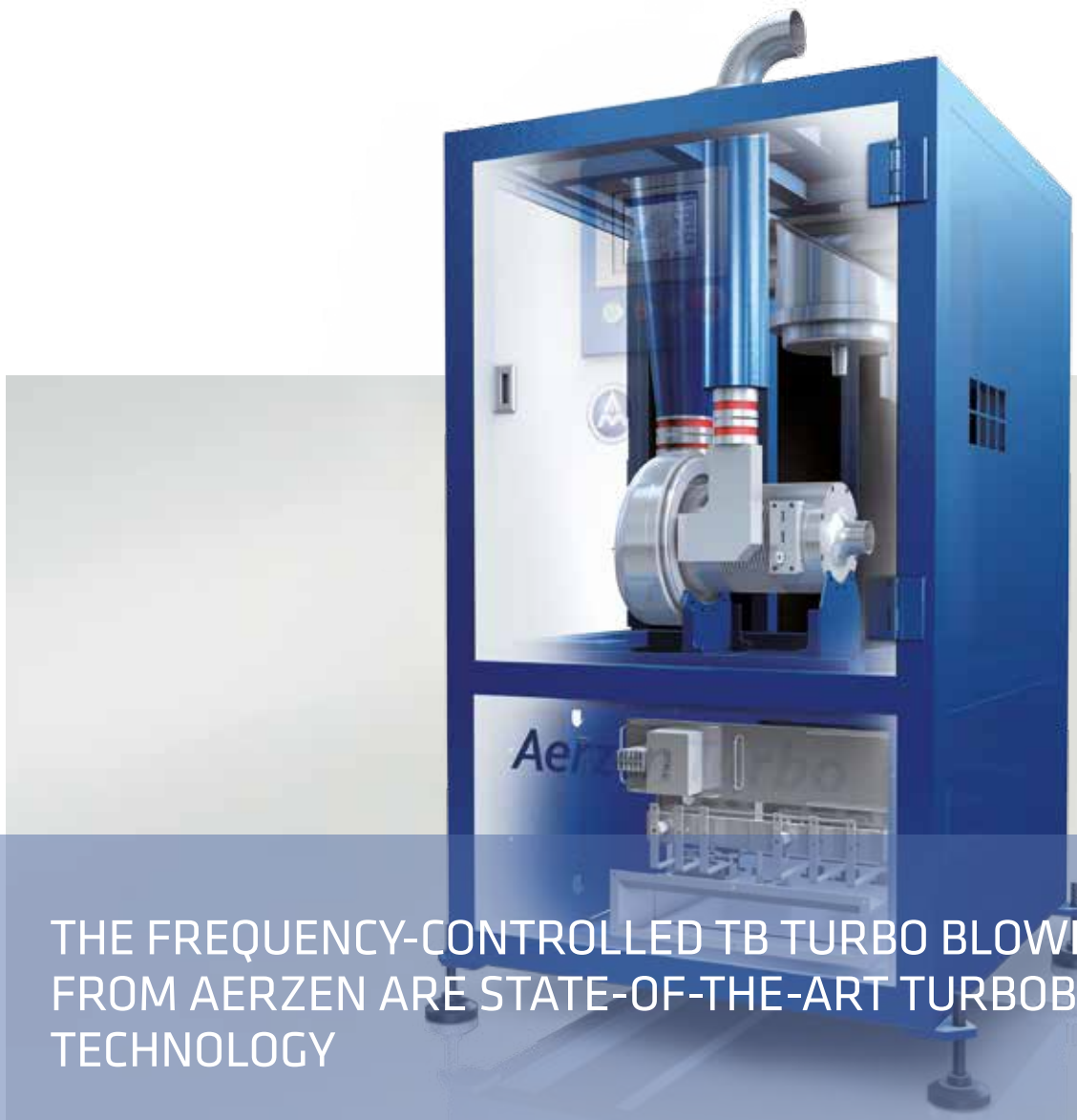
30 % for those that use pumps and compressors of any kind. This is true for waste water technology as well. Treating waste water in aeration basins accounts for anywhere from 60 to 80 % of a sewage plant's total energy consumption. What is needed here are new technologies that are both energy-saving as well as durable.

TB Turbo:
Energy efficiency that is one step ahead

Designed especially for small and medium volume flows, the frequency-controlled TB Turbo blowers from AERZEN deliver maximum energy efficiency.

Their state-of-the-art compressor technology make them perfect additions to the AERZEN portfolio: there is now the right machine for every level of volume flow.

The perfect solution for every application
Waste water treatment uses both kinds of compressors – rotary lobe and turbo. When used in combination, however, these high-performance technologies reach unsurpassed levels of efficiency. The TB Turbo can be combined with the Delta Hybrid – the world's first rotary lobe compressor – allowing users to take advantage of the wide range of technologies to maximize energy efficiency. Applied innovation for that decisive step forward.



THE FREQUENCY-CONTROLLED TB TURBO BLOWERS FROM AERZEN ARE STATE-OF-THE-ART TURBOBLOWER TECHNOLOGY

MAXIMUM EFFICIENCY. 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, security, and economy. Roundthe-clock, uninterrupted operation and maximum productivity at lower costs.

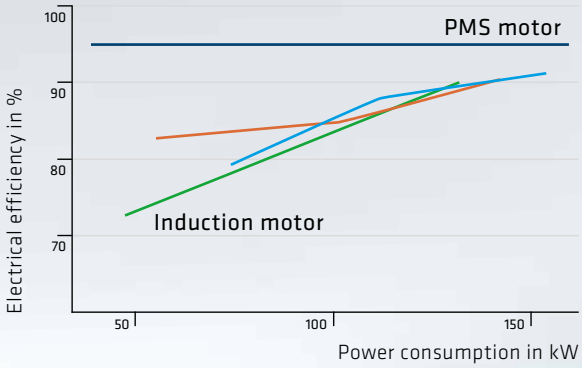
Optimally designed: the impeller design.
What distinguishes an Aerzen Turbo impeller from a regular turbo impeller? Basically everything. Take design, for example. The Aerzen Turbo Generation 5 is the result of complex CFD-based flow analyses. Each impeller is carefully designed to meet the needs of particular classes of performance. That is why Aerzen Turbo impellers are considerably more effective than those where diameter is the only customized element.

Another unique AERZEN feature is the material used: stainless steel instead of aluminum. This allows for decidedly better aerodynamic properties. And stainless steel also means better efficiency, greater longevity, and consistently lower lifecycle costs. This is because stainless steel is practically abrasion-free and corrosion-resistant.

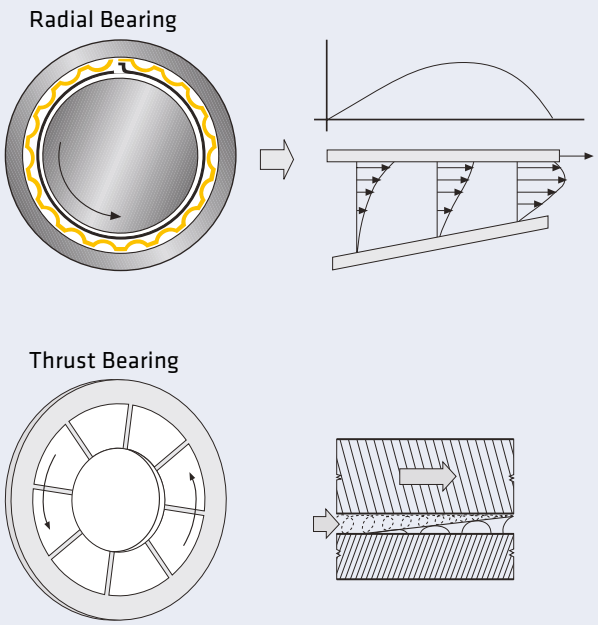
Intelligent security: the frequency converter.
New: the Aerzen Turbo frequency converter (TFC), which controls only the rotational speed based on the motor current. Guide vanes are not moved. There are advantages to this. The TFC is simpler in construction, more reliable, and completely maintenance-free. And much more efficient in operational performance, thanks to the high rise-to-surge (active pump protection), a new technology from AERZEN. This makes the TFC (compared to other standard industrial converters) less sensitive to pressure fluctuations, more responsive, and more stable in operation over the entire range of the turbo map. This is also the basis for an operational combination with displacement and continuous-flow machines.
All parameters are constantly monitored to prevent uncontrolled surge line shutdowns during unexpected fluctuations. This makes the TFC a decisive factor in the operational safety of aeration tanks. Another unique feature: this frequency converter was created by AERZEN's own R&D innovators. Another pioneering success from turbo technology.

The Aerzen Turbo impeller

Induction vs. PMS motors: a comparison.



Driven by innovation: the PMS motor.
There is a special motor driving the Aerzen Turbo: the permanent magnet synchronous (PMS) motor. Its characteristics: extremely efficient, energy-saving, highly innovative, and far superior to conventional motors. Because AERZEN devel-oped this motor especially for the turbo. Because the rotor does not require any additional energy for magnetization. Because, together with the TFC, it was designed to meet the speed and response time requirements of turbo technology. And because this motor demonstrates exceptional performance efficiency of up to 96%, even in partial load operation.

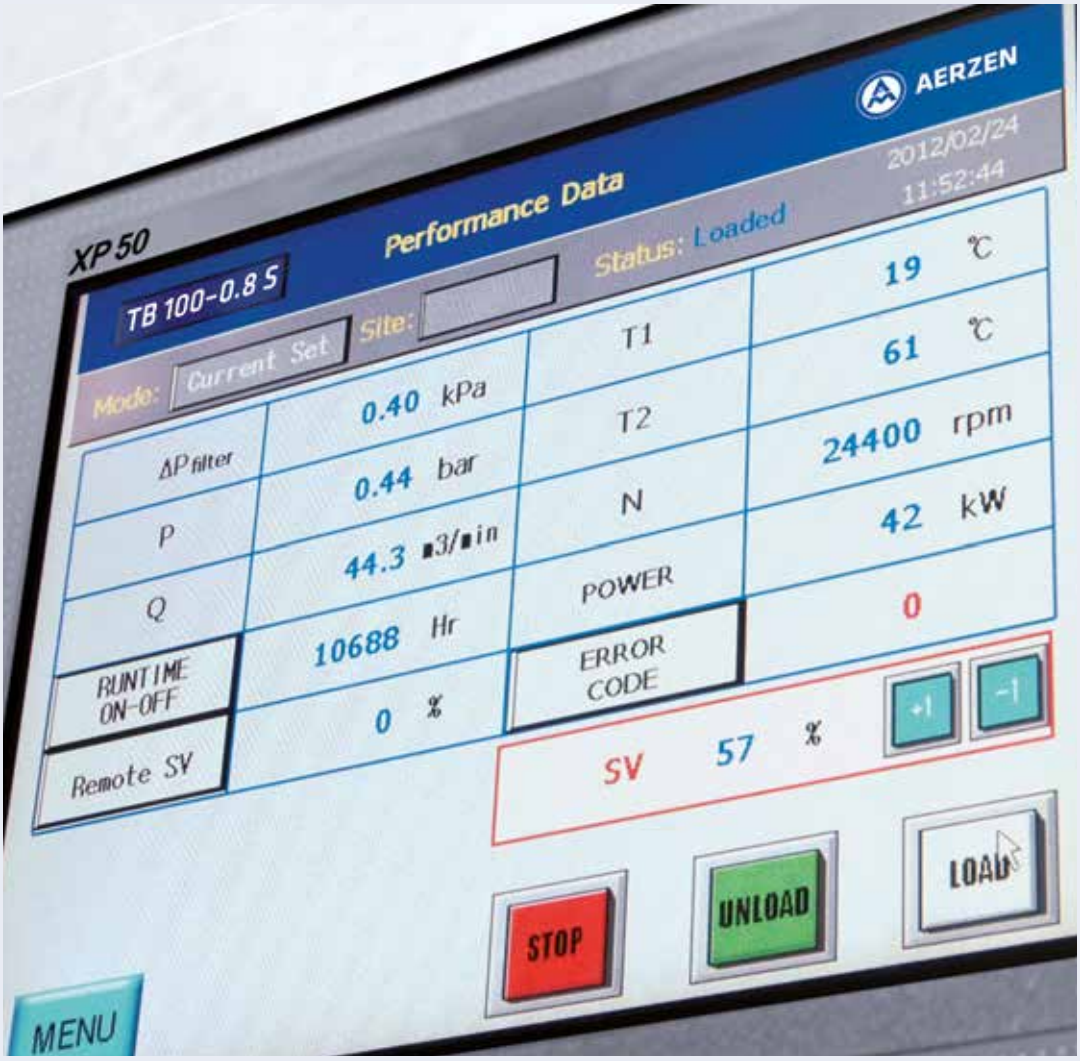


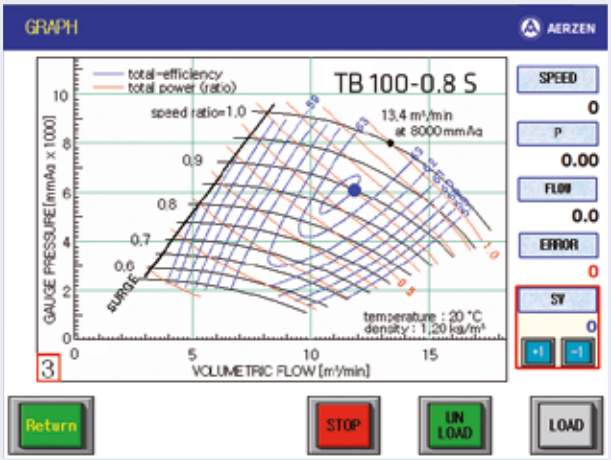
Capable of absorbing any pressure fluctuation: Air foil bearings for the PMS motor
There is a reason the AERZEN PMS motor comes equipped with an air foil bearing system: this technology, borrowed from the aerospace industry, is simple in construction and convincing in function. A cushion of air is created as soon as the shaft begins to rotate. This type of bearing has several advantages over more complex methods:

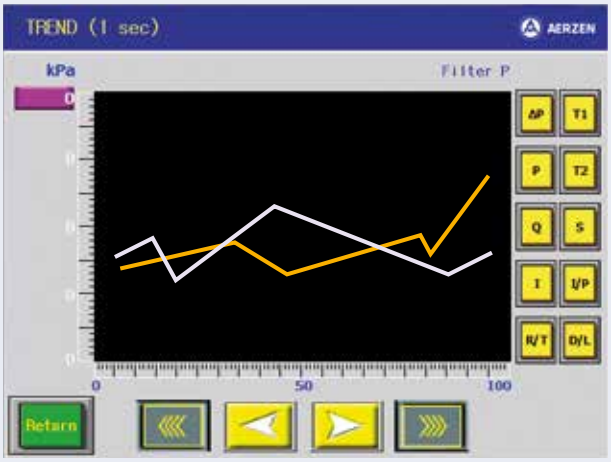
- Uncomplicated, closed system
- Contact- and vibration-free operation
- Highly functional without the need for peripherals (i.e. electronic control system, retainer bearings, safety bearings, auxiliary electronics such as backup battery systems, etc.)
- No components subject to wear
- Extremely rugged and durable
- 100% maintenance-free
- Able to withstand even large-scale pressure variations
- 100% oil-free
- Energy-saving idle mode

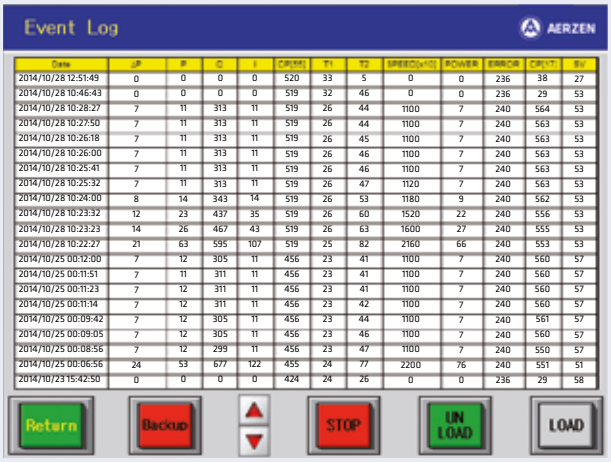
DYNAMIC SAFETY: THE TURBO CONTROL SYSTEM.

Rapid response times. Secure protection against surge and choke limits. Real-time transparency and documentation of all relevant operational parameters. The precise control of a turbo comes with its own set of requirements. This is the reason we decided against standard solutions and developed software especially for our high-efficiency turbos. The result is a fully integrated digital system. Highly functional. Easy to manage via touchscreen. And equipped with all relevant interfaces, such as to your process control system.









Unique: the turbo idle mode.
The construction of the AERZEN air foil bearing allows for extremely low rotation speeds. This means that frequent startups and shutdowns during intermittent processes can be avoided with the energy-saving idle mode.

One of many options among the Aerzen Turbo controls.

Real-time transparency:
The Aerzen Turbo control integrates all Turbo blower parameters with permissible minimum and maximum values (surge limit, maximum RPM, overload, etc.):

- Filter pressure differential
- Differential pressure
- Volume flow
- Intake and discharge temperatures
- RPM
- Electric power
- Operating hours
- Error codes and error history
- Live visualization of operational data

New: actual air volume measurement.
When it comes to absolutely secure plant operation, we don't allow any compromises. That is why AERZEN doesn't rely on conventional, indirect (i.e. air volume measurement derived from power consumption) air volume measurement. Instead, we use the Venturi effect. In other words, the actual air vol-ume flow is calculated by measuring the pressure differences at the intake cone. No other system does this, despite some decisive advantages: the unit can use real values for safety measures such as the AERZEN high rise to surge (active pump protection). And you can determine the air actually being pumped into your tanks at any given time. And by the way: the software will also display this parameter for you directly.

FROM 0 TO 100 IN COMFORT. THE AERZEN TURBO DELIVERABLES.

Just plug it in and start it up. It's that easy. After all, your turbo unit comes from the factory fully configured and assembled. And it is the most compact turbo machine of its class. Comfortably turbo right from the beginning. That's typical of AERZEN. Another reason that the turbo has had such positive reception.

Ready to connect: Deliverables with the standard model

1 **Blow off valve**
- Magnetic valve control

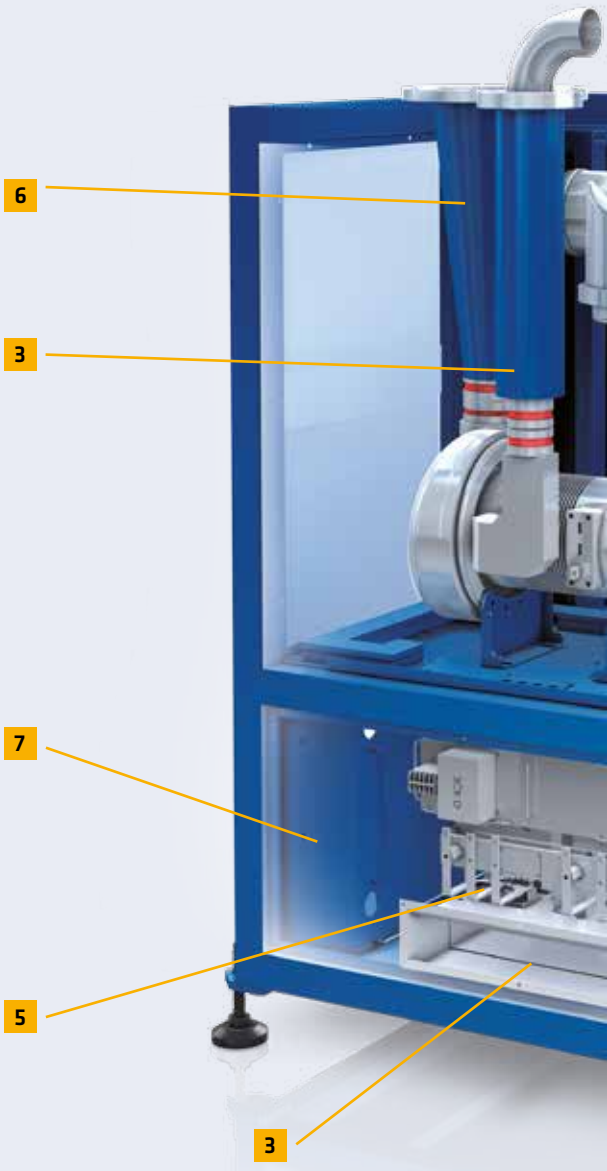
2 **Process filter**
- Easy to access and replace

3 **Air cooling**
- Simple and efficient cooling for the main motor and Frequency converter

4 **Exhaust silencer**
- Reduce the noice level while valve is opened

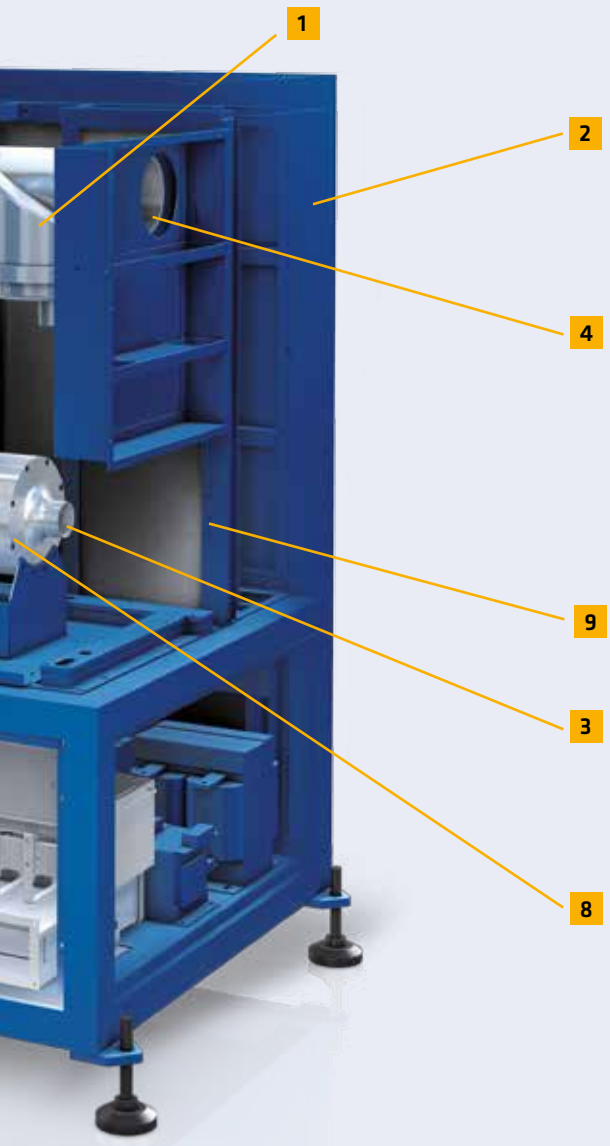
5 **Frequency converter**
- Completely integrated
- With RFI filter (optional)

6 **Cone diffusor**
- Flow-optimized pressure generation



Perfect additions:
Accessories, modifications, extensions.

- Pressure-loss optimized non-return flap
- Discharge silencer to reduce noise entering the discharge piping
- Internally guided expansion joint



7 **Aerzen Turbo controls**

- Designed and developed especially for the turbo technology

8 **Turbo motor**

- Air foil bearings, impeller, and PMS motor
- With integrated air flow measurement

9 **Intake silencer**

- Flow-optimized, noise-reduced process air inlet

AERZEN TURBO. LEADING IN THE COMPOUND SYSTEM.

Strong fluctuations are the hallmarks of load operations in biological sewage treatment plants. They can come on suddenly, since waste water pollution levels can change depending on the region, time of day and season, or precipitation. AERZEN has the most effective solution for this kind of challenge: the combination of advanced turbo blowers, rotary lobe blowers, and rotary lobe compressors in an almost revolutionarily efficient network system.

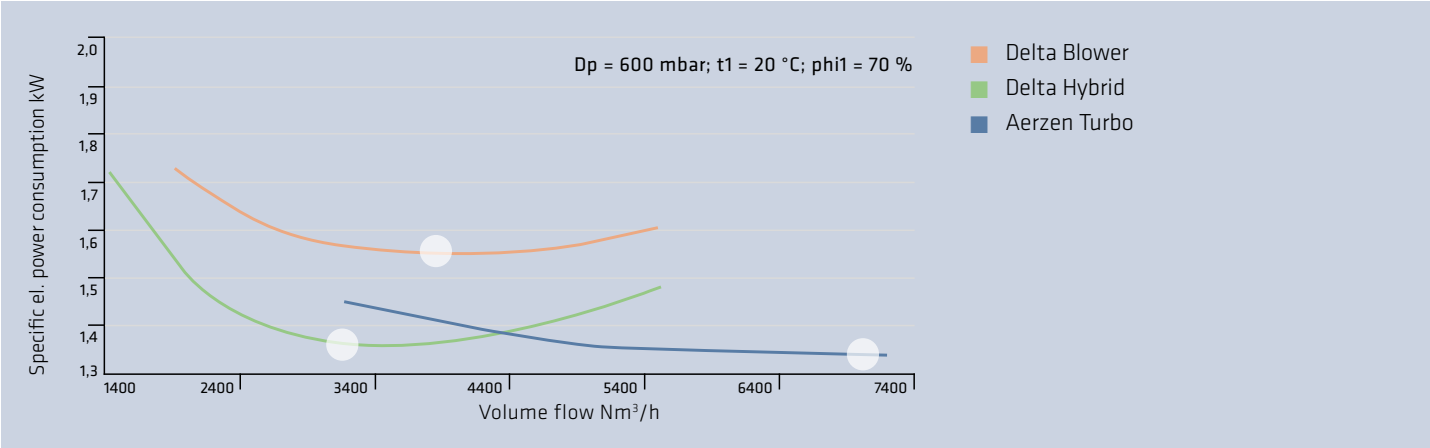
Performance³.
The new level in aeration tanks.
There is now a unique portfolio of solutions for oil-free oxygen supply to aeration tanks provided by three high-performance machines – all from the same manufacturer: the Aerzen Turbo Generation 5 blower, the rotary lobe Delta Blower, and the Delta Hybrid rotary lobe compressor. With a number of models to choose from, these units can be used to satisfy a wide variety of plant-specific requirements. In combination they can guarantee performance that for the first time can be cut precisely to the needs of an ever-changing load profile – from basic loads to peak demand. This solution portfolio is what we call Performance³.

Energy saving potential – optimally exploited.
Regardless of whether plants are being operated for municipalities or industry, the best mix of machine types and performance is always tailored to the individual instance. The final configuration requires solid knowhow and a lot of experience along with a team of experts from AERZEN who can play the whole range of available technologies. That is how you will discover the potential for process performance and energy efficiency in your plant.

Fast ROI.
Each technology, regardless whether it is a displacement machine or a turbo machine, has its strengths and weaknesses. With the focus on energy efficiency, the designpoint of the turbo blowers cannot be beaten. The control range is approximately between 40% and 100%. In case of part-load operation, turbo machines are less efficient.
On the other hand, displacement machines, such as Delta Blower and Delta Hybrid are ideal for part-load operation. They are strong in high control ranges between 25% and 100% and have good efficiency, also in part-load operation. In a combined system, the advantages of the three high-performance technologies add up to hitherto unknown energy efficiencies in the operation as a whole: the highest possible energy savings, best possible control range, and lowest possible investment costs. These savings can make a return of invest within two short years, depending on the plant involved.

Sound interesting? Give us a call. We'd be happy to provide you with detailed information – without obligation, of course.

Power requirements compared with volume flow ranges



Each kind of AERZEN technology has its advantages: the best solution is in their combination

AERZEN TURBO . AERZEN HOLDS AGAIN THE KEY POSITION WITH REGARD TO THE MOST EFFICIENT COMPOUND SYSTEMS.

SUPERIOR ADVICE. WASTE WATER TECHNOLOGY FROM AERZEN.

We can support you as a plant operator in a lot more ways than just supplying top technological solutions. We can offer you all round spelling availability of our application know how, experience and expertise. Around the world, 24 hours a day, 7 days a week.

There for you when you need us – the world over. AERZEN

952.783 hrs.

2.489.23

4.762.239

1.236.854 hrs.

3.256.489 hr

Service. When you need it, no matter where you are.
You need service – even when you don't need it. Our service teams will take care of your plant over its entire life cycle, helping to protect the value of your investment. We have created a close network that spans the globe: over 45 subsidiaries and representatives in more than 100 countries, so that we are never far from where you are. You can depend on it: one of our 100 service mechanics can be there for you quickly – if you should ever need one.

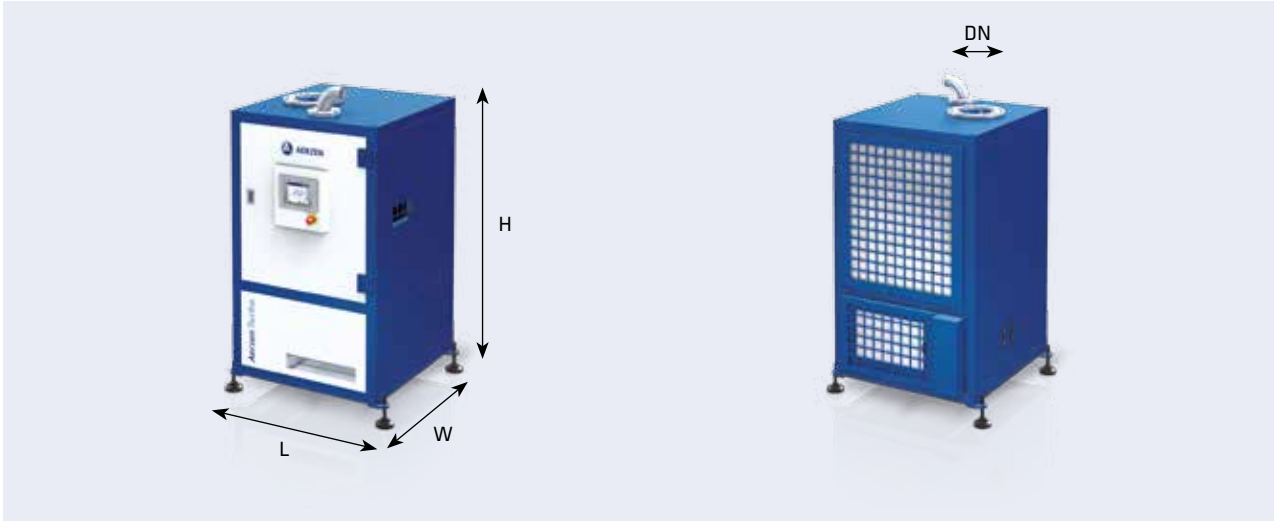
Security = AERZEN.
- commissioning by qualified experts
- individualized training for your in-house staff
- client-specific service and maintenance contracts
- remote maintenance system for your unit
- on-site service also available

Well prepared. Our application expertise.
There are 150 years of history behind our familiarity with a very wide range of compressor technology applications. And more than 25,000 configured waste water plants on every continent. A veritable treasure trove of experience. It is the basis for our unique expertise and innovation. And makes us valuable advisors for all your application questions. Take advantage of our knowhow when you want to equip your treatment plant both technically and economically for the coming decades.

37 hrs.
hrs.
s.

EFFICIENCY UNDER THE MICROSCOPE. THE TURBO IN NUMBERS.

Sizes and weights.



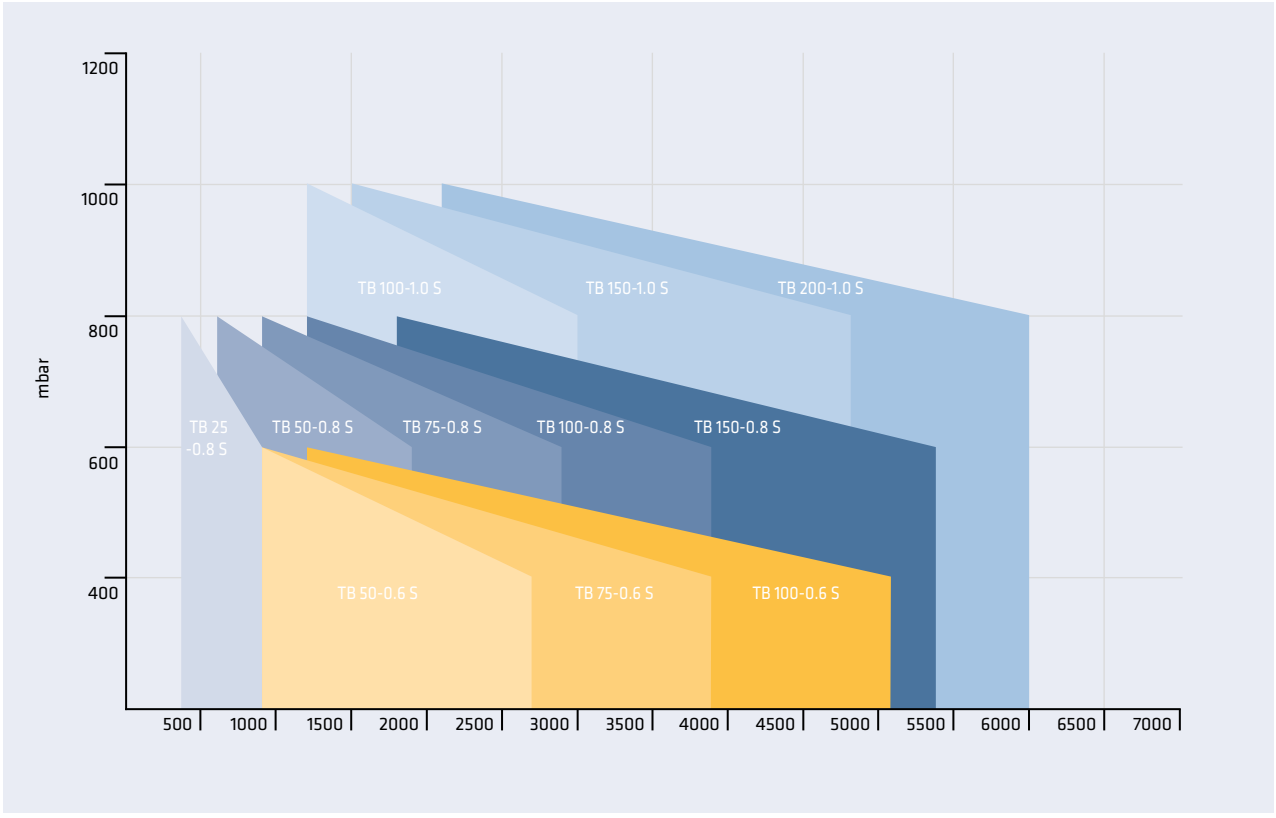
Blower models	Performance data					Sizes and weights				
	Pressure	Volume flow		Motor performance	Sound pressure level	Length	Width	Height	DN	Weight
	max. mbar	min. m³/h	max. m³/h	max. kW	max. dB(A)	mm	mm	mm		kg
TB 25-0.8 S	800	360	900	20	79	815	834	1350	100	540
TB 50-0.6 S	600	900	2700	40	79	815	834	1350	150	540
TB 50-0.8 S	800	600	1900	40	79	815	834	1350	150	540
TB 75-0.6 S	600	900	3900	60	79	855	964	1500	200	680
TB 75-0.8 S	800	900	2900	60	79	855	964	1500	200	680
TB 100-0.6 S	600	1200	5100	80	79	855	964	1500	250	680
TB 100-0.8 S	800	1200	3900	80	79	855	964	1500	200	680
TB 100-1.0 S	1000	1200	3000	80	79	855	964	1500	200	680
TB 150-0.8 S	800	1800	5400	120	79	995	1160	1600	250	890
TB 150-1.0 S	1000	1500	4800	120	79	995	1160	1600	250	890
TB 200-1.0 S	1000	2100	6000	150	79	995	1160	1600	250	890

(Subject to technical modifications – products subject to technical changes)

SHOWING THEIR STRENGTHS. THE UNITS AND ITS OPERATION RANGES

Which turbo unit can handle what kind of load? You'll find the answer in the wide range of Aerzen Turbo models TB for you to choose from. There are 11 unit variants available, depending on pressure requirements and volume flow.

Pressure and volume flow ranges: an overview



The turbo types: variety for optimized plant configuration

AERZEN. Compression as success factor.

The Aerzener Maschinenfabrik was founded in 1864. In 1868 we built Europe's first rotary lobe blower. The first turbo blowers followed in 1911, the first screw compressors in 1943, and in 2010 the world's first rotary lobe compressor unit. AERZEN innovations are a driving force behind the development of compressor technology. Today, AERZEN is one of the world's oldest and most important manufacturers of rotary lobe blowers, rotary lobe compressors, rotary lobe gas meters, screw compressors, and turbo blowers. And in many areas of application, AERZEN is among the undisputed leaders.

There are more than 2000 experienced AERZEN employees in over 45 subsidiary companies worldwide working hard to advance compressor technology. Their technological expertise, our international network of experts, and the constant feedback from our customers are what make us successful. AERZEN products and services have become standards in the industry for reliability, lasting value, and efficiency. Go ahead: challenge us!

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