

# PillAerator

MAGNETIC BEARING TURBO COMPRESSORS



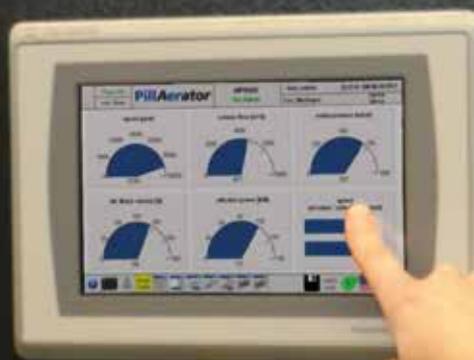
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> Made  
> in  
> Germany

The state of the art blower  
for your process air

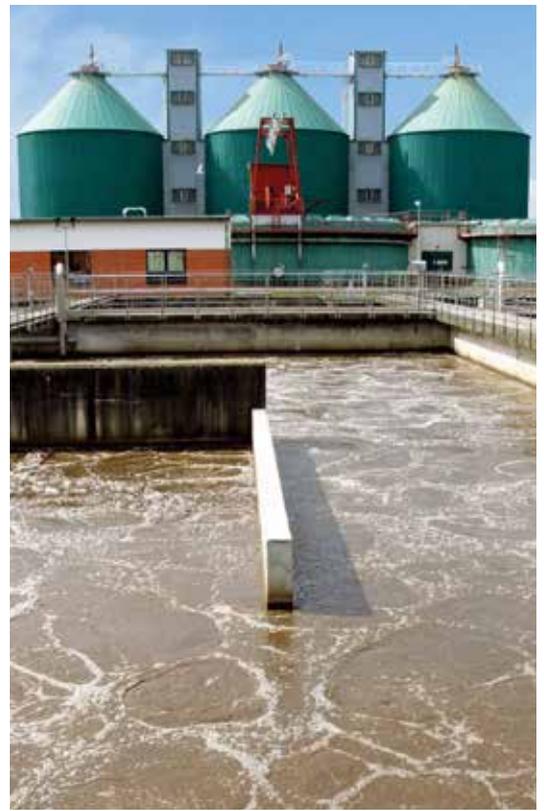


# 5 arguments to improve your process



1. EFFICIENT
2. SIMPLEST INTEGRATION
3. SAFE
4. ECONOMICAL
5. ALL-INCLUSIVE

Dorina Nolte during  
a commissioning  
at the PillAerator factory



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## 1. EFFICIENT

UP TO 84 %

Thanks to its direct-drive, magnetic bearing motor and intelligent control system, the PillAerator can achieve unbalanced efficiency of up to 84% in an ideal situation. This means you can achieve energy savings of up to 25 %\*.

## 2. SIMPLEST INTEGRATION

PLUG & PLAY

Set up - connect - and you're ready to go!

## 3. SAFE

INTELLIGENT CONTROL & DIAGNOSTICS

Centrally control the PillAerator with the SCADA or with the multilingual integrated HMI. Predictive maintenance enables monitoring, error reading and even remote control; and this can be performed on a running system.

## 4. ECONOMICAL

OIL & MAINTENANCE FREE MOTOR

The PillAerator requires no routine maintenance apart from an air filter change in dusty environments. With the oil-free PillAerator, oil changes and bearing replacements are a thing of the past, thanks to the magnetic bearing motor.

## 5. ALL-INCLUSIVE

ALL IN ONE

The PillAerator is the all-inclusive solution that has everything you need: Industry 4.0-ready, IoT-ready, PLC, a frequency converter, instrumentation, sound insulation, water cooling.

*\*compared to conventional rotary blowers*



## OVER 100 YEARS OF INNOVATION

Based in Germany, Pillaerator is a wholly owned subsidiary of Piller Blowers & Compressors GmbH and has over 100 years of flow technology know-how.

PillAerator

I'M  
MADE IN  
GERMANY

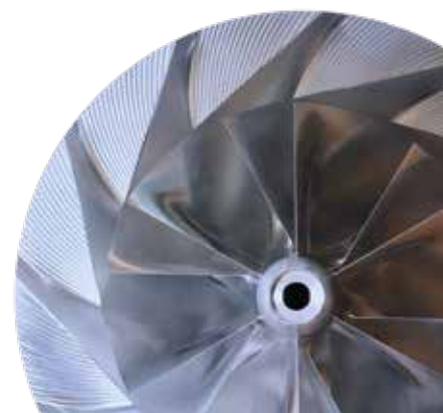
PillAerator  
MP 6000

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**PillAerator**



**WE ARE  
STATE OF THE ART**





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## MAGNETIC BEARING TURBO COMPRESSORS

With passion, in-depth knowledge of turbo compressors and challenging projects, our focus is on adapting the PillAerator even more to its operational processes.



# WE ARE ENTHUSIASTIC





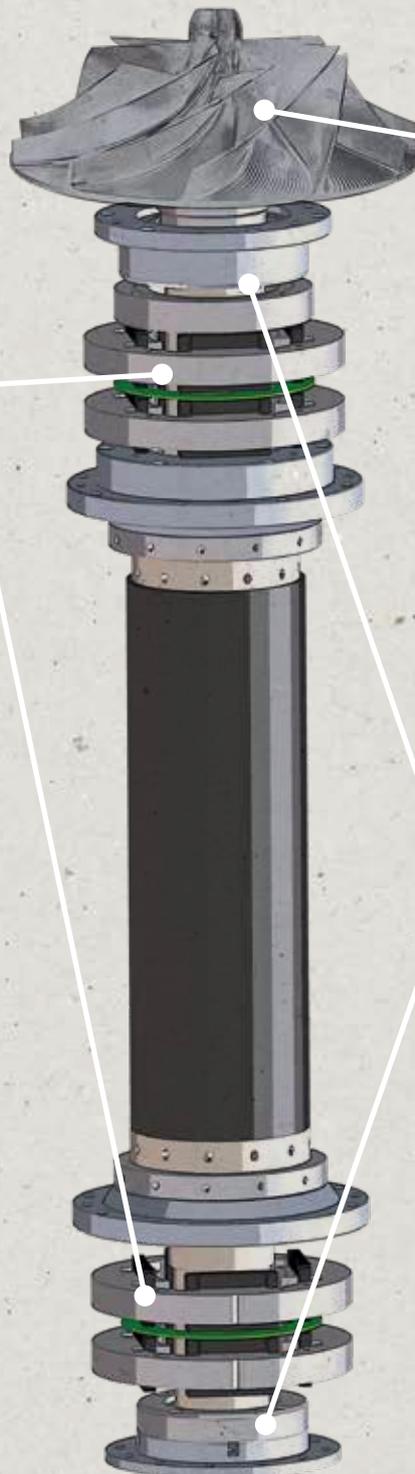
## INTEGRATION INTO YOUR SYSTEM

The integration of the PillAerator into your SCADA is easy and it can be implemented via various interface types.



# Thomas, how does ... the magnetic bearing work?

"The figure shows the magnetic bearing of our synchronous motor with the directly mounted impeller."



## Impeller

- The impeller compresses the intake air
- Together with the special housing design, it provides a wide range in the operational field
- Milled from one piece of specially alloyed aluminum

## Magnetic bearing

- Ring-shaped permanent magnets & electromagnets hold the shaft

## Safety bearing

- When deactivating the magnetic bearings, the shaft is held by safety bearings

i

Due to the dynamic magnetic bearing, the motor is:

- ▶ oil-free
- ▶ vibration-free
- ▶ friction-free
- ▶ wear-proof
- ▶ maintenance-free



Head of Research and Development  
**Thomas Abrams** answers questions  
about the magnetic bearing motor.

### *How does the magnetic bearing work?*

It's like magic! Our vertically arranged drive shaft connected to the impeller levitates contact-free in a magnetic field. In order to achieve this, imagine a metal rod with annular permanent magnets and electromagnets arranged around it. These powerful, annular magnets keep the shaft contact-free and permit only one movement around the axis of rotation so that wear-prone components are omitted. The motor is gas-tight and cannot be contaminated by the ambient air. This increases the operational safety, availability and operational life of the machine for the operator.

### *What are the specific advantages?*

The advantages of a magnetic bearing are evident, due to the fact that the shaft always runs at the center of mass and is therefore vibration-free. It requires no lubricant since it is contact-free. Even frequent start and stop processes are possible without wear. When shutting down, the shaft is guided to a standstill in the magnetic field. In the unlikely failure of the magnetic bearing electronics, the shaft is safely led to a standstill by safety bearings.

### *How often is maintenance work required?*

The PillAerator has an integrated and monitored intake filter. This must be replaced depending on the degree of contamination of the air. It's so easy that the customer can do it. This saves time and money. The same applies to the air inlets for the cooling air. The PillAerator needs no more service than that!

### *There are still power cuts in developed countries. How does the PillAerator react to this?*

That's absolutely right, a permanent and secure power supply cannot always be found everywhere. Power cuts can even occur in regions that are well-supplied. To prevent the magnetic bearing drive unit from being damaged in the event of a power cut, we have found a technical solution that works without additional components such as high-maintenance batteries and expensive UPS systems.

The PillAerator works immediately after a power cut.



Client:  
**EWB Eichsfelder Wirtschaftsbetriebe  
Gesellschaft mbH**

# INNOVATION by TRADITION

- Energy savings with the  
PillAerator since 2008

With its 800-year-old buildings, the romantic town of Duderstadt in Lower Saxony is playing a pioneering role in saving energy in the wastewater treatment process. In 2008, it decided to switch to the PillAerator, ... which operates faultlessly, of course.

At a glance, Duderstadt is one of Germany's best-preserved medieval cities. With over 600 connected timbered houses, the city center has remained virtually unchanged to this day.

However, on closer inspection, the city reveals a second, future-facing vision. As a location for many high-tech companies, Duderstadt combines its proven tradition with trend-setting technologies.

EWB Eichsfelder Wirtschaftsbetriebe Gesellschaft mbH is responsible for the wastewater treatment in Duderstadt. High maintenance and service costs as well as a aeration solution that wasn't optimally designed led to a rethink in 2008.

**How can cost savings and  
maximum aeration availability  
be achieved?**



# PillAerator



*The PillAerator MP 6000  
in front the historical  
city hall in Duderstadt*



**For a truly suitable result, the system as a whole must be scrutinized.**



After a tour of Pillaerator GmbH, a reference plant - and the convincing presentation of the innovative technology, the decision was made: Two magnetic bearing Pillaerator HP4000 turbo compressors would save energy and reduce costs in the wastewater treatment plant.

It was out of the question for the technology-loving Duderstädter to commission an engineering firm for the implementation and execution. Since the conversion represented a logistical challenge, the EWB again trusted Pillaerator GmbH's many years of experience.

The three old conventional turbo compressors were replaced with Pillaerators and integrated into the plant control system in two days, without interruption the aeration.



Pillarator



**PILLER**

The Center of Motion.



# PillAerator

Sporting performance!

Installation and initial operation

in a single day



Precise project planning, the prefabrication of piping components, the prior transfer of power and I & C lines, the instruction of assembly and welding experts including all lifting and material handling equipment, all led to the conversion being complete after an impressive 1.5 days, and then the PillAerators entered into service. Even until today!

## "At any time" summary.

In the past 10 years, in addition to the cyclical exchange of air filters, it was just a matter of renewing a coolant pump. The Duderstadt waste water treatment plant operator is completely satisfied with the PillAerator.

*Happy 10th anniversary!*



*The PillAerator MP 6000 with external air conditioning for safe operation in hot, tropical-humid climates*

**PillAerator**

# Stays Cool

even when the

# HEAT

rises

A modern water cooling system and  
air conditioning unit for humid and  
very hot temperatures up to 55 °C

### AIR CONDITIONING UNIT - EXTREME

- ▶ Guarantees maximum performance even in very hot environments
- ▶ Protects electronics from overheating and dust
- ▶ Up to + 55 °C

### AIR CONDITIONING UNIT - TROPICAL

- ▶ Guarantees maximum performance in hot and humid environments
- ▶ Cools electronics and protects them from moisture
- ▶ Up to + 45 °C





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*External air conditioning unit for cool temperatures inside the PillAerator*

## AIR-WATER AND WATER-WATER COOLING

The standard integrated cooling system of the PillAerator ensures smooth operation thanks to permanently constant temperatures inside the machine.

Through the combination of an air-water and a water-water cooler, the resulting amount of heat is always reliably dissipated. This ensures stable temperature conditions that optimally support the durability of the motor and the electronic components and ensure the performance of the PillAerator even at high temperatures.

## AIR CONDITIONING UNIT

With the right air conditioning unit, the PillAerator meets the climatic challenges of hot regions, whether in the tropics or in an extreme and dusty desert climate. Smooth operation can be guaranteed up to an ambient temperature of 55°C.

The air conditioning works by air circulation. Contaminations of dirt particles or corrosion due to high humidity and other external environmental influences are prevented.

Profibus DP

Analog signal Ethernet/IP

Industry 4.0 - Ready

IoT - Ready



# Fit for Industry 4.0

Successfully save energy with intelligent regulation

Many municipalities and companies are turning out to be true energy savers. Therefore, it makes sense to inspect the operating costs of the energy-intensive process air.

According to the motto "Turn off the light when leaving the room!", the changing parameters in the energy saving process must be responded to quickly and as needed.

The compressor is the largest energy consumer in a waste water treatment plant. Savings here create the greatest benefit for the operator.

By combining our highly efficient turbo compressor Pillaerator with our intelligent and innovative control system, operating costs can be reduced by up to 25% in an ideal scenario.

Therefore, the control system of the Pillaerator also makes an important energy saving contribution. It does enable you to do the job that best suits your process, it also responds quickly to changing parameters.

By using the latest measurement technology and the perfect interaction of the main components, it's possible to regulate between 15% and up to 100% of the motor power. In addition to this, an efficiency level of up to 84% can be attained in an ideal scenario.

## Motor speeds from 0 - 30,000 rpm.

Thanks to its infinitely variable and continuous motor speed control, the power is regulated exactly according to the requirements of your process. The Pillaerator can easily master frequent machine starts and stops, which are a real challenge for other technologies.

The frequency converter always regulates the operating points precisely and responsively. Mechanical, wear-prone and sometimes



The Pillaerator with **Allen Bradley CompactLogix** as the controller has been produced especially for the North American market



Pillaerator HP 4000 with **Siemens S7** controller

sluggish control elements, which only allow limited settings with reduced efficiency, are not required. The excellent efficiency of the frequency converter also contributes to the high energy efficiency of the Pillaerator. In addition, when starting the motor with the frequency converter, the starting current is limited to the nominal current. No longer need to invest in an additional soft starter.

## Remote Customer Support

### Communication

The Pillaerator communicates with your SCADA Profibus DP, Profinet, EtherNet/IP or via analog signals. A gateway can also be used to implement communication with other bus systems.

All operating parameters can also be monitored and adjusted directly at the machine. The touch panel, our Human Machine Interface (HMI), enables direct on-site power control and diagnostics.

On request, our service department can monitor the condition of your machines during ongoing operation, read errors, analyze and make optimizations via LAN or wireless mobile communication from our head office.

**Our Remote Customer Support saves time and money.**

Further technical developments as well as changes within your system can therefore be inexpensively adjusted even after several years.



# Aeration of **WASTEWATER TREATMENT PLANTS**





## Smooth deployment in the Göttingen waste water treatment plant

Depending on the weather, the Göttingen waste water treatment plant is confronted with around 30,000 to 80,000 cubic meters of waste water every day, which has to be cleaned. With the help of the Pillaerator, tens of thousands of cubic meters of dirty brown water are transformed into clear water within 24 hours.

© Avatar\_023/ Fotolia





**"Dr. Detlef Lobas,  
how can the  
PillAerator  
significantly  
contribute to  
climate  
protection?"**

**Process air is a significant cost factor in technical processes due to the high energy requirement. However, the use of state-of-the-art magnetic bearing turbo compressors can drastically reduce power consumption and associated CO<sub>2</sub> emissions.**

Displacer blowers (PD blowers) were previously widely used for the production of process air, as these types of blowers have been available for decades and exhibit robust technology. However, these technical dinosaurs are now completely outdated and their technology antiquated, so they are increasingly being replaced by modern VFD-controlled turbo compressors. The life cycle costs of a typical process air application can be reduced enormously compared to conventional PD blowers when using a PillAerator. These savings in energy costs help reduce your electricity bill and carbon footprint in nature. The investment in a magnetic bearing turbo will pay for itself within 2-3 years, despite investments that are two to three times higher than for a PD blower.

**TURBO IS NOT NECESSARILY ALWAYS TURBO!**

Mechanical and air bearing turbos are also available on the market. These turbos are also energy efficient, but come with technical disadvantages. The magnetic bearing compressor is regarded as state of the art for the production of process air. It achieves an efficiency level of more than 84%. The PillAerator is the world's leading magnetic bearing turbo compressor among a few competitors, defining the newest technology in this sector and one of the first of its kind.

**TAKE A STEP INTO THE FUTURE  
- WITH THE PILLAERATOR!**

*Dr. rer. nat. Dipl.-Chem.  
Detlef Lobas*

PillAerator

# There's always trouble with the neighbors

To prevent this, every PillAerator is equipped with integrated silencers.

Machine noise is increasingly a burden and hazard to the health of employees in production facilities. Noise reduces the ability to concentrate, which not only reduces productivity but also the rate of operational accidents increases enormously. In addition, it is all too common for warning and alarm signals not to be heard. The most frequently diagnosed occupational illnesses include so-called noise-induced hearing loss.

Preventive, cost-intensive soundproofing solutions are required to counteract this, such as soundproof booths, acoustic ceilings or soundproof walls. An Environmental Noise Directive exists for the workplace in the EU, which requires hearing protection to be worn when the noise levels exceed 80 dB (A).

Thanks to the integrated silencer, the PillAerator requires no additional soundproofing measures to ensure noise levels don't rise above 80 dB (A).



*For those who want more (less): it is possible to reduce the noise emission through the use of additional **silencers**.*



Average  
Home Noises  
55 dB



Vacuum  
Cleaner  
70 dB



72 - 78 dB

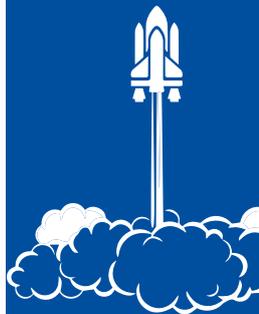


Loudest  
Snore  
87 dB

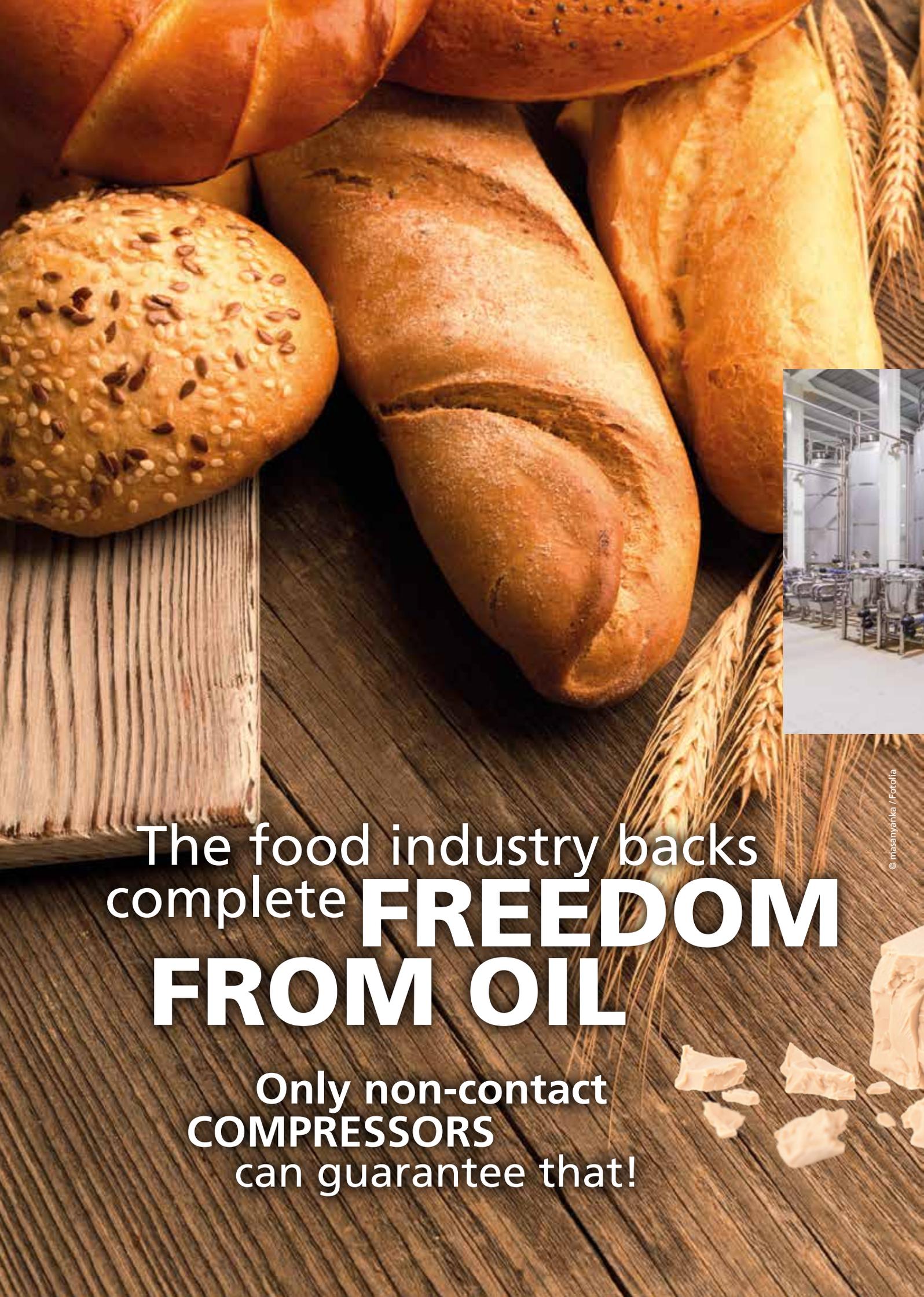


Ahhh<sup>hh</sup>  
Ahhh<sup>hh</sup>

Crying  
Baby  
110 dB



Space  
Shuttle  
170 dB



The food industry backs  
complete **FREEDOM**  
**FROM OIL**

Only non-contact  
**COMPRESSORS**  
can guarantee that!



## The PillAerator for the aeration of bioreactors

The use of conventional oil-lubricated technology in the food industry generally entails great risk. Oil is an ever-present potential source of contamination. Already, with the low discharge of aerosols, as is typical with conventional blowers and compressors, the smallest oil particles can be sucked in and enter the food chain.

The PillAerator features maintenance-free magnetic bearing technology, which operates without issues or wear without the use of oil. There is no alternative to complete oil freedom in the food industry

– “OIL-FREE CLASS PillAerator!”



# 2 SERIES

## with 6 MODELS

### to fulfill your REQUIREMENTS

THE 150 kW AND 300 kW SERIES  
· THE RIGHT PILLAERATOR FOR EVERY SPECIFICATION



*Pillaerator  
HP 4000*

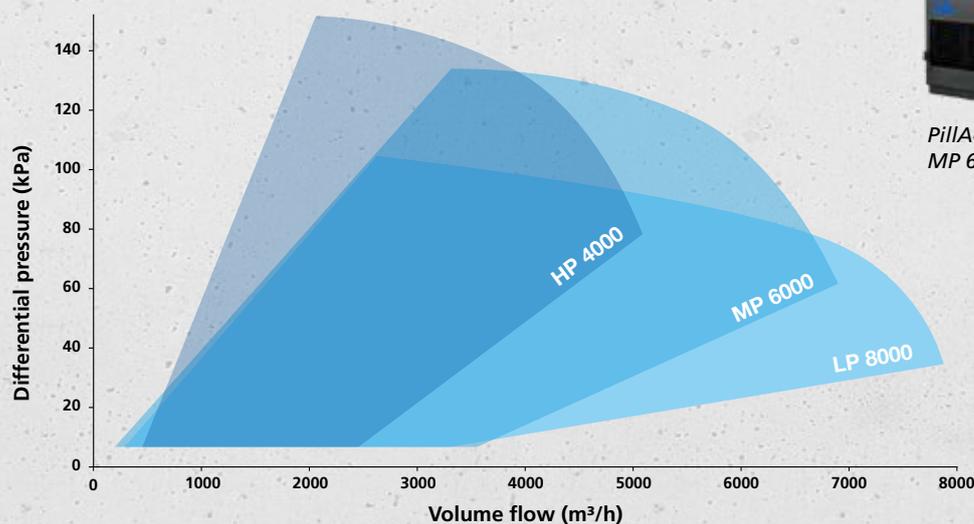
The 150 kW series for a volume flow up to 8.000 m<sup>3</sup>/h and the 300 kW series for up to 17,000 m<sup>3</sup>/h. There are three Pillaerator models within each of the two performance series. Due to the different impeller designs of the drive units, each model provides different pressure and flow rates.



*Pillaerator  
MP 6000*

*Pillaerator  
LP 8000*

#### PERFORMANCE RANGE OF THE 150 kW SERIES



Measured at standard conditions  
Medium: Air, Inlet pressure: 1.013 bar  
Inlet temperature: 20 °C, Density : 1,204 kg/m<sup>3</sup>

# PillAerator BrainBox

The multi-compressor  
control unit

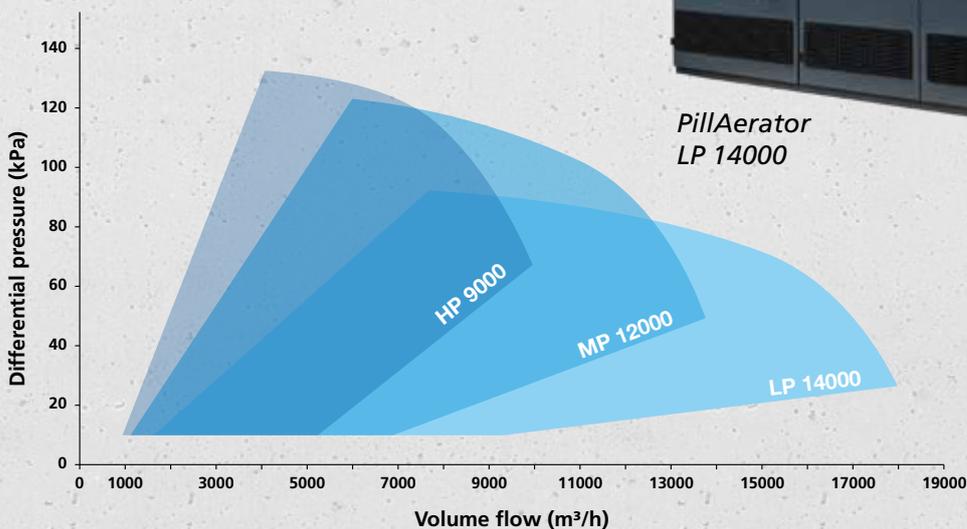
- ▶ Always the ideal compressor combination
- ▶ Ensures the highest efficiency at all times

If several PillAerators are to be operated together, our multi-compressor control **BrainBox** is used.

It is always possible to use the optimal combination of compressors with the **BrainBox**. Not only are the individual compressors switched on or off as needed but the control system automatically regulates the machines for the best combined efficiency. This creates a unique combination of performance, energy efficiency and flexibility. Discover the possibilities!



## PERFORMANCE RANGE OF THE 300 kW SERIES



Measured at standard conditions  
Medium: Air, Inlet pressure: 1.013 bar  
Inlet temperature: 20 °C, Density : 1,204 kg/m<sup>3</sup>

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# PillAerator in Italy

PillAerator representative in Italy, Matteo Artesani, shows us what sets us apart from the Italians.



**Milano - Milan.** The city of Milan Fashion Week, featuring shows by Gucci, Versace, Prada, Armani and Dolce & Gabbana. The city with two top international football clubs. There's no doubt about it, there is movement in this metropolis. We walk through the Vittorio Emanuele II gallery, with its luxury shops, cafés and expensive restaurants, and meet Matteo Artesani from ARTEMA S.r.l., the PillAerator representative for Italy at the cathedral square.

**The Italian mentality is very different to the German mentality. Italians approach tasks in a more impartial way and react much more emotionally in conflicts. How does this emotionality affect the daily work with Italian customers?**

Basically, you have to say goodbye to this romantic view of charming, casual Italians. It's a tough business. Parallels to the sunny and easy life of Italian films from the 70s are fictitious. We, in industry, are under the same pressures from implementing European standards as anybody else in the EU. It is true, however, that Italians react much more emotionally in conflicts. My role as a representative is to try and avoid these conflicts from the beginning, or, if they arise, to mitigate and settle them.

**That applies to most preconceptions. If you look beyond the cover, you will discover a completely different side.**

**The Italian mentality is always presented as very warm, open and amicable. How would you describe the relationship with your customers?**

My customer relations are always very friendly. They are fundamentally based on trust. Trust in the reliability of the engines and the people behind them. Finally, I sell our engines because of their compelling technical superiority over other compressors.



**ARTEMA S.r.l.**

*Matteo Artesani*

Segrate MI

Tel. +39 02 2640783 · [info@artema.net](mailto:info@artema.net)

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# Worldwide Representatives

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# FAQ

PillAerator

## THE FOUR QUESTIONS MOST FREQUENTLY ASKED TO PILLAERATOR

Hello!



Power cut!  
What now?

Not everywhere is a permanent and secure power supply available. In order to ensure the compressor is not damaged in the event of a power cut, PillAerator GmbH has found a solution that works without additional components such as high-maintenance batteries and expensive UPS systems. The PillAerator can operate again immediately after a power cut without any additional measures.

**Power cuts are not a problem. Similarly, constant start-stop intervals are not an issue for the PillAerator.**

Thomas Abrams  
Head of PillAerator R&D

How frequent are the service intervals?

Hello!

+49 (0) 5554 201 - 111

Which service intervals? The PillAerator requires no regular service stops on your system.

That's just one of the reasons for the low operating costs of the PillAerator. In dusty environments, we propose a regular filter change as a maintenance measure. ▶ ***This just takes 2 minutes.***

What do I have to consider before my PillAerator is delivered?

- A floor with a sufficient load capacity ·
- A communication cable to your control system ·
- The power current ·

The machine room must have sufficient load capacity to set up one or more PillAerators. The PillAerator has height-adjustable feet for accurate adjustment. A power cable with three-phase current is to be provided for the power supply. It is important to pay attention to a TNS-TNC network for grounding. Integration into your control system is possible with Profibus, Ethernet or analog communication cables. The use of further control connections is possible on request.

Olá!

How long do I have to wait for my PillAerator?

Depending on the size of your order, we expect production times of 8 weeks. Shipment depends on vessel availability and destination.

Commissioning the PillAerator is done in a single day.

Manuel Dias  
PillAerator  
Project Manager



Dominik Warnecke  
PillAerator Sales





- 
1. Effective & economical
  2. Smart & safe
  3. All in One
- 



### PillAerator service

1. Optimal design for the aeration of your plants
2. Quick integration into existing systems
3. On-site initial operation and personal instruction
4. Remote customer support



### Your PillAerator

1. Calculation of your savings potential
2. Needs assessment
3. Integrability assessment
4. Order with short delivery times

## PillAerator



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We will demonstrate how you can noticeably **reduce your energy costs** with **100% clean process air.**

