

# ROTARY LOBE BLOWERS

## DELTA BLOWER GENERATION 5

Intake volume streams from 30 m<sup>3</sup>/h to 15,000 m<sup>3</sup>/h



**AERZEN**

# THE DELTA BLOWERS. ROBUST, DURABLE MACHINES FOR COUNT- LESS COMPRESSOR PROCESSES.



## **Delta Blower Generation 5**

They are the driving force behind countless processes, the heart of a powerful machine assembly: the Delta Generation 5 rotary lobe blowers. They represent the distillation of almost 150 years of AERZEN experience and development work, but are more innovative than ever. AERZEN has packed a number of new features into its latest generation of delta blowers: oil-

free conveyance of air and neutral gases; a broad control range for volume streams of from 30 m<sup>3</sup>/h to 15,000 m<sup>3</sup>/h; reduced life-cycle costs; easy handling; quieter operation. What hasn't changed: the extremely robust, extremely reliable, and extremely durable nature of this global success story. No wonder that their owners are so enthusiastic about putting them into continuous service – year in and year out, decade after decade.





**Applications**

- Water and waste water treatment
- Aeration
- Filter backwashing
- Pneumatic conveyance of bulk materials
- Gas conveyance
- Degassing

- Dust removal
- Vacuum production
- Biogas treatment and many others

**Industries**

- Sewage treatment
- Chemical and process technology
- Power plants
- Cement and lime
- Foodstuffs
- Paper and many others

# THE UNIVERSAL GENIUS FOR EVERY APPLICATION.

The versatile and compact Delta Blower units can be deployed in any climate zone on Earth. In the most challenging outdoor environments just as safely as in covered indoor spaces. They can be used as both standalone units or in complex assemblies. They are as reliable in earthquake zones as they are aboard ships or in other mobile applications.

## Versatility in Detail.

Delta Blowers are powerful all-round geniuses. Miniature units can be mounted on silo vehicles, the largest machines can be used in lifting units. They are used to unload ships – at up to 1,000 tons an hour.



Control range from  
25% to 100%



Intake volumes streams from  
30 m<sup>3</sup>/h to 15,000 m<sup>3</sup>/h



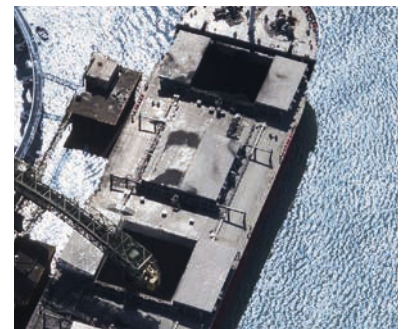
Positive pressure up to  
1,000 mbar



Nominal widths from  
DN 50 to DN 400



*Indispensable for power plant*



*Powerful performer for loading and unloading ships*

# MACHINES AND SERVICES FROM AERZEN. HIGHLY ACCESSIBLE AND AVAILABLE AROUND THE WORLD.

The durability of Delta Blower units is legendary. Just like their proverbial reliability, lifespan, and intelligent operating and maintenance design. Why bring up AERZEN services at all, then? Because service is necessary. And because the service teams we have on call across the globe are an important decision criterion for plant operators: a decision for blowers “made by AERZEN”.

*The heart of the Delta unit: the triple-lobed AERZEN blower stage*



## **High availability.**

The best blower units are the ones you don't notice. Because they do their work reliably, year in and year out. The Delta Blowers from AERZEN are just this kind of unit. There's a reason they have a reputation for robust nature and long

service life: AERZEN makes all the components itself. Right down to the control system. From the initial idea through engineering to configuration. Which is how we can guarantee the productivity of our machines. Our contribution to the “Made in Germany” quality designation.



*A reliable partner –  
the world over*

**There for you – the world over.**

Typically AERZEN: that our solutions should be so reliably available. That means our machines, of course, but also our services. Our teams will take care of your units throughout their entire operational life, thus helping to protect the value of your investment. And the fact that we have a network of over 40 affiliates and service representatives in more than 100 countries around the world means we're never far away. We can be there for you quickly – when you need us.

**AERZEN: always the right choice.**

- Commissioning done by qualified personnel
- Individualized training for customer's specialists
- Customer-specific service and maintenance contracts
- Delta-real time monitoring for your unit
- On-site machine modifications (if needed)

**Intelligently made.**

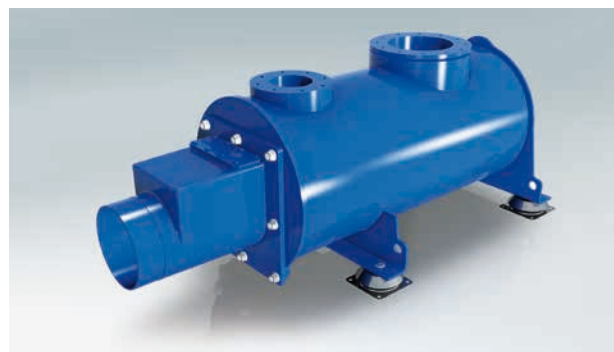
What do they mean, the terms “compact, easy handling, maintenance-friendly”? These are our promises to you for the day-to-day operation of our products, and they're worth their weight in gold. Some concrete examples:

- Small footprint
- Flexible machine mounts
- Easy to move with a fork lift or pallet truck
- Space-saving side-by-side setup

- Plug and play installation and commissioning
- Easy access to all parts subject to wear
- Oil levels can be checked while machine is in operation
- Maintenance work such as changing oil and filters done from the front of the machine
- Low noise levels
- Belt-driven for optimal volume streams; retrofitting is fast and easy

**100% clean .**

How can we offer machines that can be used for handling foodstuffs, without the need for extensive cleaning that would interrupt production? By eliminating absorption material in the muffler. AERZEN designed the base support to function as a discharge muffler, reducing noise by air deflection alone. 100% free of absorption material that would otherwise cause wear and contaminate downstream systems. The base supports, by the way, are AERZEN patents and are also certified as spark arresters for use in ATEX applications.



*Intelligent noise reduction: the AERZEN discharge muffler with no absorption material*

# BLOWERS ARE BLOWERS, RIGHT? AN END TO PRECONCEPTIONS.

**AERZEN is one of the world's most innovative providers of compressor technology. For over 150 years. And it was almost 150 years ago – 1868, to be exact – that we produced Europe's first rotary lobe blower. Since then we have raised the bar for each generation of this technology. Let yourself be surprised. Discover the extraordinary blowers: the Delta Blower Generation 5.**

## **Extremely robust**

- for a broad range of applications in control ranges from 25 to 100%
- many types of possible modifications

## **Compact design**

- space-saving side-by-side setup
- smaller engine rooms

## **Operation-friendly, low-maintenance design**

- high availability in continuous operation under difficult environmental conditions
- control and maintenance from the front of the machine

## **Plug&play**

- pre-configured, parameterized, ready to run
- integrated service package with funnel and initial oil fill

## **Oil-free per Class 0**

- per ISO 8573-1, TÜV certified

## **No absorption material**

- for use in the pneumatic conveyance of bulk food items (no contamination).
- secure, energy-efficient water treatment (no deposits of absorption material on aeration plates, no clogging of filter media, no pressure losses)

## **Integrated power component (optional)**

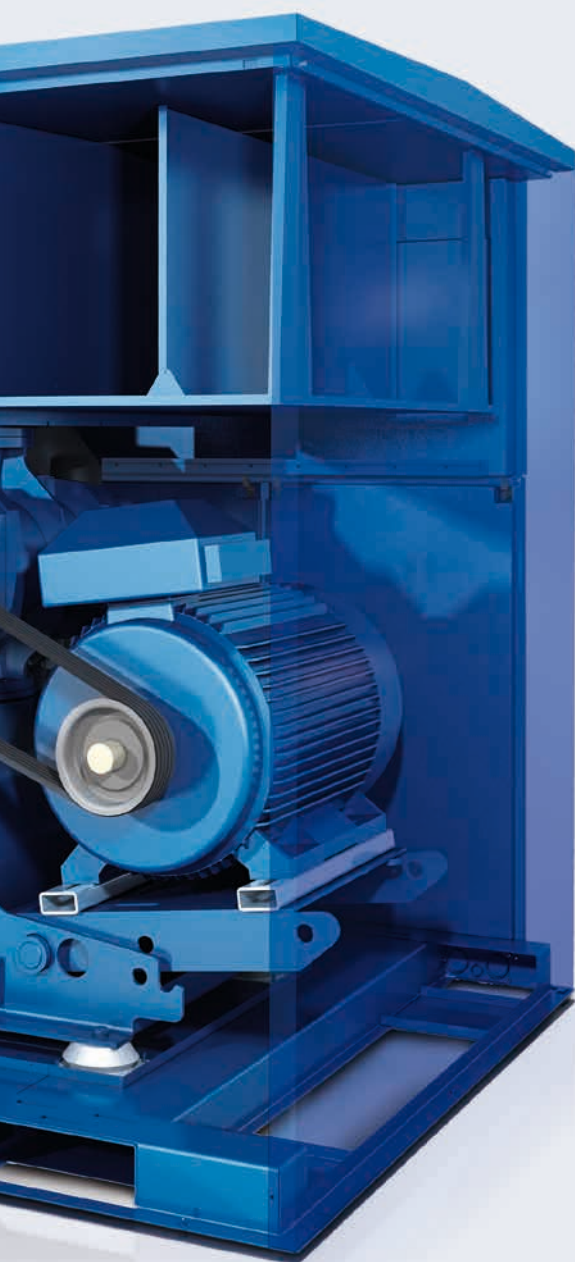
- frequency inverter, delta-star, direct/soft start
- intelligent AERtronic control

## **Smart oil system**

- oil levels can be checked with the machine running
- readable from outside the machine
- oil instead of grease: bearings lubricated with oil last longer







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#### **A plus for the environment**

- energy-efficient Class IE3 motors as standard equipment
- intake on the cold side of the unit
- basic unit integrated into a highly efficient machine network with rotary lobe compressors and turbo blowers from AERZEN
- retrofitting is fast and easy

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#### **Belt-tensioning hinged motor mounting plate**

- fully automatic and maintenance-free belt tensioning
- no need to monitor V-belt tension
- very easy to mount or replace V-belts

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#### **Multifunctional hinged motor mounting plate and lifting jack**

- safer transport
- easy, secure V-belt installation
- mobile installation (e.g. aboard ship / in earthquake zones)
- Hinged motor mounting plate as support for heavy motors

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#### **Low noise levels**

- for easy compliance with noise level regulations near populated areas and production facilities
- minimal noise levels with optimized acoustic hood
- integrated pulsation reduction process (patented AERZEN blower stage)

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#### **Approval per PDE guidelines (pressure valve)**

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#### **ATEX compliant**

- AERZEN base plates certified as spark extinguishers for ATEX applications

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#### **TÜV-certified zone separation filter**

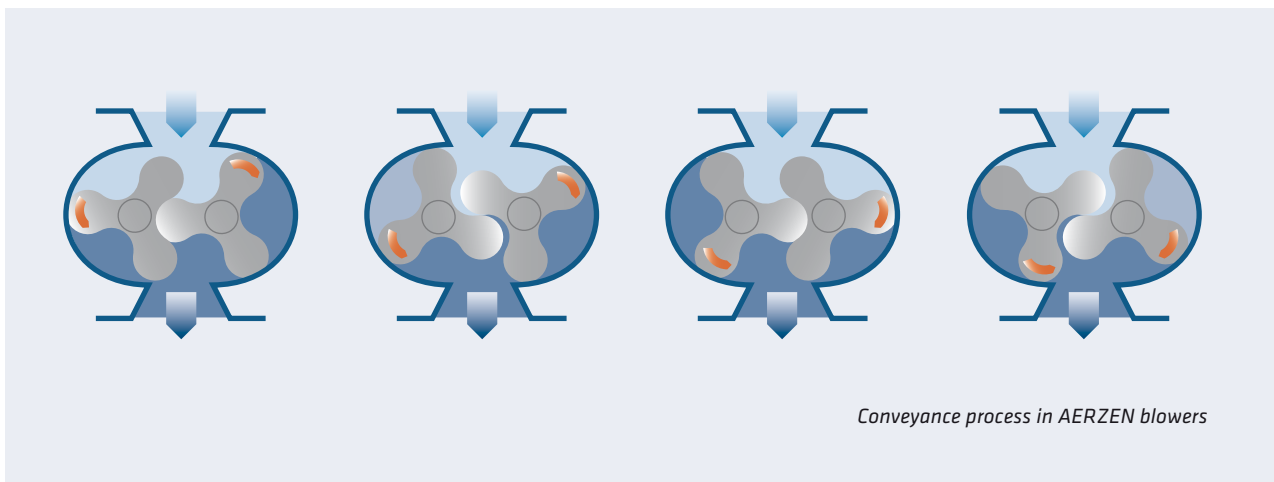
# WANT TO KNOW MORE ABOUT WHAT'S INSIDE? DESIGN AND CONSTRUCTION.

It's good to know what all is inside each and every AERZEN Delta blower unit: The wealth of experience of a global market leader. The quality expected of a family firm with a long history of excellence. The goal of providing the best solutions for our customers. And a principle that underlies thousands and thousands of successful applications: **Roots.**

## **Innovative pulsation reduction.**

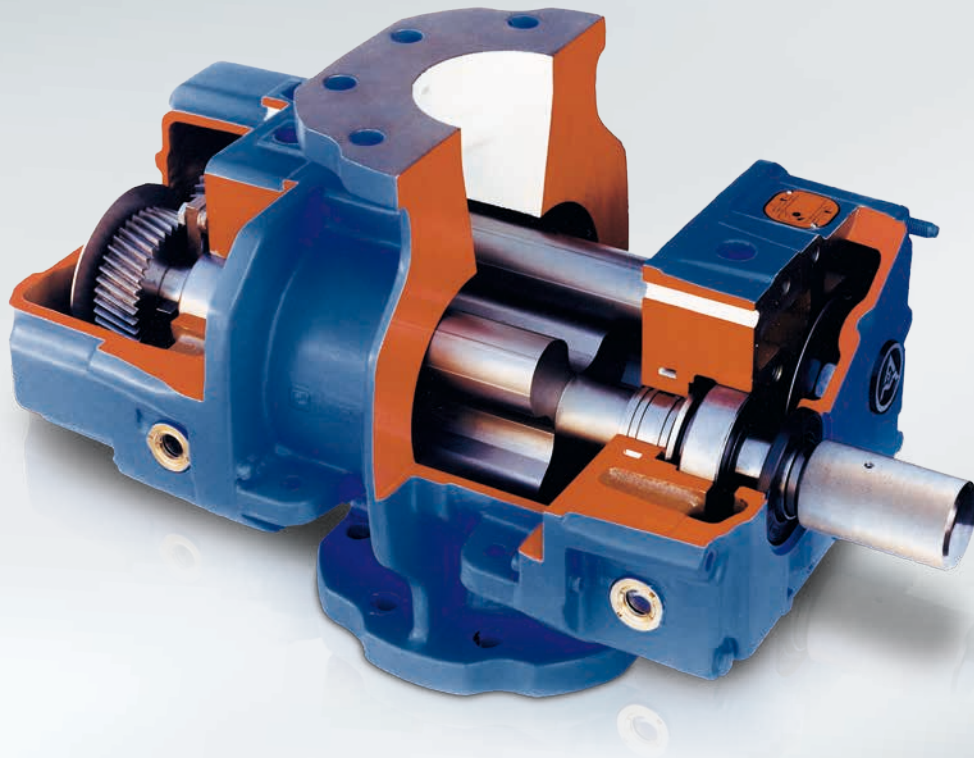
AERZEN has developed a unique process especially for the Delta Blower series and integrated it into all its models: pulsation reduction. This patented AERZEN process prevents disruptions in the machine even before they arise. The triple-

lobed rotors in the Delta blowers have two channels cast in the cylinder. These channels control backflow into the conveyance chamber to eliminate the blowback and crimping impulses that were typical of double-lobed blowers. A patented interference process that means an end to pulsation.



*Intelligent technical details are your guarantee for the lasting value of the Delta blowers. One example from among many: the patented pulsation reduction process, an AERZEN innovation that increases the lifespan of the bearings.*

*The inner values are what count: a view  
into an AERZEN blower*



#### **Blower stage**

- Triple-lobed blower with integrated pulsation reduction
- Housing: cylinder (with two integrated, pressure-side pre-inlet channels to reduce noise through pulsation reduction), wheel well, housing lid, and side plates
- Made of EN-GJL-200
- Ribbed surface

#### **Rotors**

Models GM 3 S to GM 80 L:

- Rotors and shafts drop forged from C45N

Models GM 90 S and GM 30 L:

- Rotors and shaft drop forged from EN-GJS-500-7

Models GM 150 S to GM 240 S:

- Rotors made of EN-GJS-400-18-LT, shafts of C45N

#### **Drive type**

- Overhung via narrow V-belt.
- Direct drive

#### **Cooling**

- Convection cooling

#### **Lubrication**

- Oil bath for bearings and timing gears

#### **Oil-free conveyance**

- Oil-free operation per ISO 8573-1 Class 0 is guaranteed by using proven piston ring labyrinth seals combined with neutral chambers (open to the atmosphere)

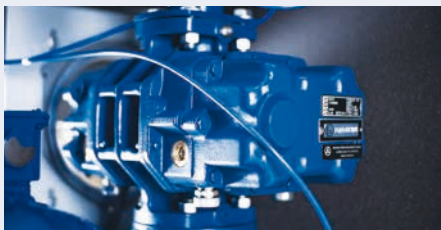
#### **Timing gears**

- Made of case-hardening steel, hardened and ground, with helical gears
- Attached to the shaft via taper interference fit
- Extremely smooth running, very long operational life

# EXCEEDING STANDARDS. AERZEN DELIVERABLES.

Some do comfortable. Others do efficient. We do both. When your Delta Blower unit is delivered, it comes completely configured, parameterized, ready to plug and run. Designed especially for your processes, of course. And including all the standardized accessories and components you'll need for flawless operation at the push of a button.

The AERZEN "All-in" concept: Standard deliverables.



- 1 Triple-lobe blower stage**
- with integrated pulsation reduction (see page 10/11)

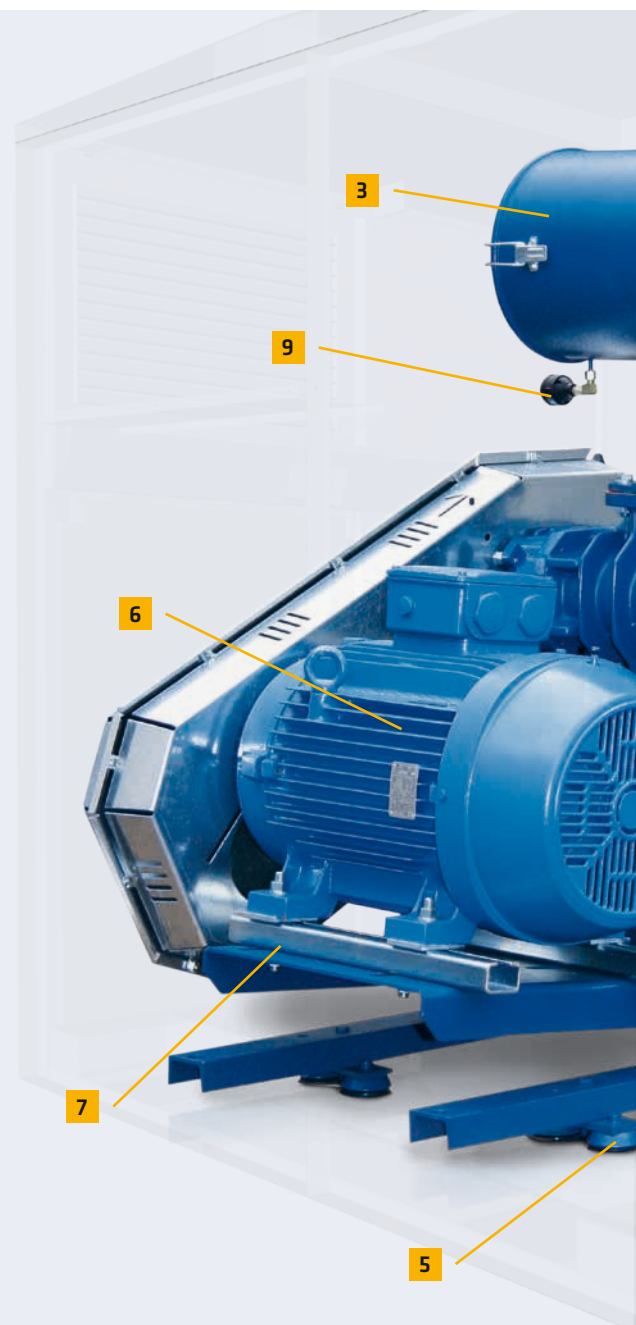
- 2 Base plate with integrated discharge muffler**
- Certified as ATEX spark arrester per EU guideline 1999/92/EC
  - Muffler free of absorption material

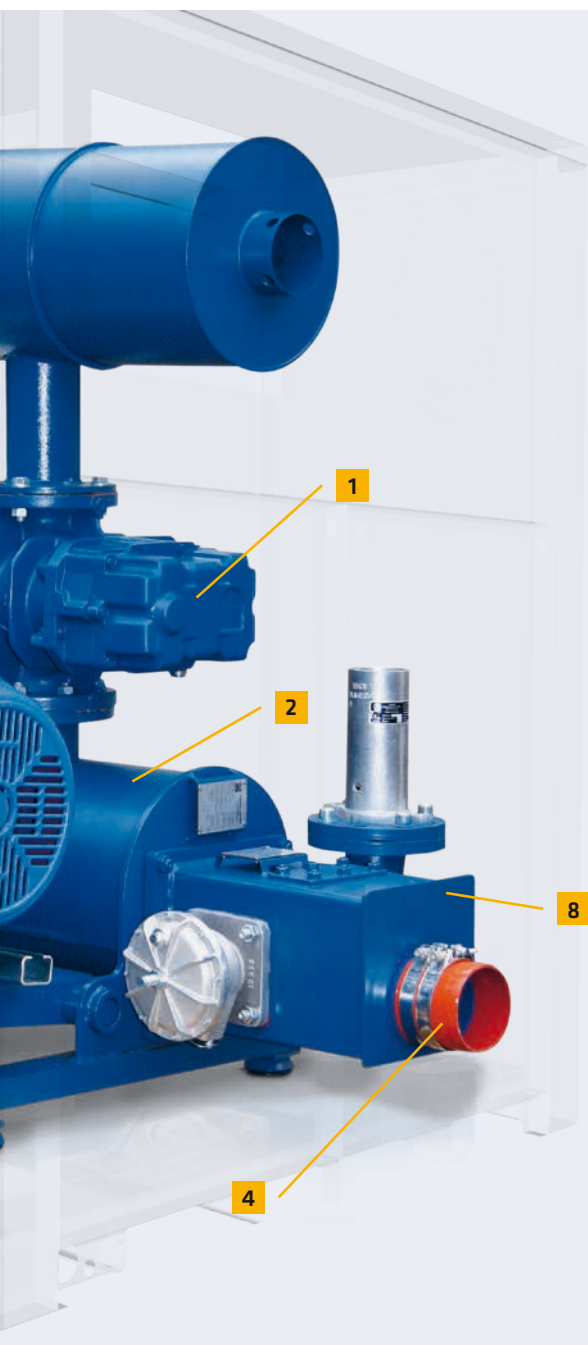


- 3 Intake muffler with integrated air filter**
- Normal intake from the surrounding area
  - Conduit intake optional

- 4 Flexible rubber bushing**
- With clamps

- 5 Flexible machine mounts**
- To decouple machine-borne noise





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#### Motor

- High-performance narrow V-belt drive with three-phase AC motor
- Energy-efficient Class IE3 motors (up to motor size 315) as standard equipment



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#### Hinged motor mounting plate

- Automatic V-belt tensioning.
- Multifunctional hinged motor mounting plate and lifting jack

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#### Terminal box

- With pressure valve (8) per PED guideline 97/23/EC
- built-in non-return flap

9

#### Instrumentation

- Pressure gauge for displaying conveying pressure
- Maintenance indicator for monitoring intake filter

#### Added value: Accessory components.

- Acoustic hood for indoor and outdoor installation, force-air ventilated via mechanical filter
- Startup load relief (10), needed with delta-star motor startup
- Pressure-side axial compensator in place of flexible rubber bushing
- Control cabinet: delta-star, frequency inverter, soft-starter
- AERZEN AERtronic blower control
- Additional accessories on demand



AERZEN startup load relief

#### Modifications.

- Special motors
- Special finishes
- ATEX-compliant design
- Acoustic hood with special sand collector for use in desert locations
- Acoustic hood for low temperatures (to  $-40^{\circ}\text{C}$ ) with heater and gravity-activated blinds
- Acoustic hood for earthquake safety and increased wind resistance
- For use aboard ships and in motor vehicles
- For conveying specialty gases by using specialized materials
- Customer-specific documentation



Always a safe choice: ATEX-compliant AERZEN design

#### Efficient control.

AERtronic is easy to use. But above all, AERZEN's control system is an important part of the unit's safety design: it guarantees that your facility will be operating at optimal efficiency levels at all times. The AERtronic offers a broad spectrum of functions. It can visualize operational data, run the operating hours counter, provide early notifications of operational events, and save all this information in memory. AERtronic will also keep you informed about upcoming maintenance and service cycles, meaning that service calls can be planned for more efficiently, helping to increase the lifespan of your machine's components significantly.



# WEIGHTY ADVANTAGES. IN A LEAN MACHINE.

**Dimensions and weights** (Technical data subject to change – Products subject to technical alteration).



## Delta Blower.

Model	H	D	W	A	B	Nozzle size DN	Weight without acoustic hood	Weight with acoustic hood
3 S	1055	800	800	228	245	50	148 kg	212 kg
4 S	1280	1135	925	258	258	80	207 kg	299 kg
7 L	1280	1135	925	258	258	80	212 kg	304 kg
10 S	1280	1135	925	258	258	80	236 kg	328 kg
10 S	1500	1350	1250	294	375	100	336 kg	496 kg
15 L	1500	1350	1250	294	375	100	351 kg	511 kg
25 S	1500	1350	1250	294	375	125	407 kg	567 kg
30 L	1900	1800	1500	356	435	150	690 kg	1020 kg
35 S	1900	1800	1500	356	435	150	780 kg	1110 kg
50 L	1900	1800	1500	356	435	150	830 kg	1160 kg
50 L	2111	2055	1700	357	525	200	905 kg	1475 kg
60 S	2111	2055	1700	357	525	200	1035 kg	1605 kg
80 L	2308	2200	1900	456	600	250	1550 kg	2200 kg
90 S	2308	2200	1900	456	600	250	1620 kg	2270 kg
130 L	2345	2850	2100	410	635	300	2436 kg	3410 kg
150 S	2345	2850	2100	410	635	300	2796 kg	3750 kg
220 L	3500	4304	2800	410	800	400	4981 kg	8240 kg
240 S	3500	4304	2800	410	800	400	5371 kg	8630 kg

*Weights without motor and belt drive*

## Delta Blower with integrated power supply.

Model	H	D	W	A	B	Nozzle size DN	Weight with acoustic hood
10 S	1500	1350	1850	294	375	100	619 kg
15 L	1500	1350	1850	294	375	100	661 kg
25 S	1500	1350	1850	294	375	125	717 kg
30 L	1900	1800	2100	356	435	150	1322 kg
35 S	1900	1800	2100	356	435	150	1412 kg
50 L	1900	1800	2100	356	435	150	1462 kg
50 L	2111	2055	2300	357	525	200	1825 kg
60 L	2111	2055	2300	357	525	200	1955 kg

*Weights without motor, electrical equipment, and belt drive*

# BLOWER POWER IN DETAIL. THE PERFORMANCE TABLES.

The Delta rotary lobe blowers are high-performance products. They were designed for use in many different areas of application: 16 models in 9 nominal widths from DN 50 to DN 400, intake volume streams from about 30 to 15,000 m<sup>3</sup>/h, positive pressures up to 1,000 mbar, negative pressures down to -500 mbar.

## Noise values.

The sound pressure levels from machine noise (L<sub>p</sub>(A)) per individual unit are based measurements taken outdoors at a distance of 1 M from the exterior of the machine (tolerance of ± 2 dB). Noise measurement per DIN 45 635, DIN ISO 3744 and DIN EN ISO 2151.

## Using the performance tables.

You will find all the important performance data for the Delta series in the performance tables: intake volume stream ( $\check{V}1$ ), required coupling power (P<sub>k</sub>), motor size and noise level (L<sub>p</sub>(A)). The intake volumes shown are based on commonly available belt drive ratios in increments of about 12%. Lower drive speeds are also possible, depending on the final temperature.

### Parameters.

$\check{V}1$	[m <sup>3</sup> /min]	Intake volume stream
p <sub>1</sub>	[bar abs]	Intake pressure
Δp	[mbar]	Pressure differential
t <sub>1</sub>	[°C]	Intake temperature
t <sub>2</sub>	[°C]	Final temperature
n <sub>G</sub>	[rpm]	Blower rotational speed

n <sub>M</sub>	[rpm]	Motor rotational speed
P <sub>k</sub>	[kW]	Shaft power
P <sub>mot</sub>	[kW]	Nominal motor power
L <sub>p</sub> (A) o. H.	[dB]	Noise pressure level for blower unit without hood
L <sub>p</sub> (A) m. H.	[dB]	Noise pressure level for blower unit with hood

*Delta Blower is the driving force in countless processes. There is a good reason for the exceptional range of applications: the robust power units from AERZEN can be configured for just about any requirement, even in standard implementations.*



















**AERZEN. Compression as success factor.**

AERZEN was founded in 1864 as Aerzener Maschinenfabrik. 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 2,000 experienced AERZEN employees in over 40 affiliates 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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EXPECT PERFORMANCE