

Innovation from
tomorrow's world



Delta Hybrid

Innovation from tomorrow's world

Aerzener Maschinenfabrik, founded in 1864, employs today some 1700 associates worldwide and is present in over 100 countries with over 30 subsidiary companies and many representatives.

Relying on experience in the design and production of rotary lobe blowers since 1868 and screw compressors since 1943, Aerzen has continually set new standards for quality and innovation in the field of twin-shaft positive displacement machines. Aerzener Maschinenfabrik counts among the pioneers of compressor technology and is today one of the leading manufacturers worldwide.

This unique combined experience from the worlds of rotary lobe blowers and screw compressors is the foundation upon which the new groundbreaking and future-oriented Delta Hybrid technology has been developed – the first series of Rotary Lobe Compressors!

The groundbreaking Rotary Lobe Compressor is the result of a synergy between the rotary lobe blower and the screw compressor technologies and offers completely new possibilities for generating positive pressure or vacuum by combining the technical advantages of both concepts.



A total of 7 patents or patent applications currently make the Delta Hybrid one of the most innovative products in compression technology.

While low pressure applications call for the Roots-Principle of isochoric compression, the screw compressor, with its internal compression, becomes the preferred choice for its energy efficiency in higher pressure ranges.

The package concept is based on the well known and successful Aerzen Delta design (Delta Blower and Delta Screw) and has been systematically upgraded.

- **Highest energy efficiency and reduction of the Life Cycle Costs**
- **Reliability and durability**
- **Low noise levels, without absorption material**
- **Space saving, easy handling and reduction of maintenance costs**
- **Expanded operating- and increased pressure ranges**

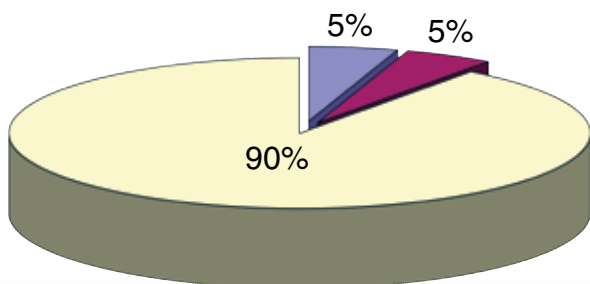


Highest energy efficiency and lower Life Cycle Costs


Over a ten year operating period, energy costs equate to 90% of the total Life Cycle Costs (LCC) of a compressor; the actual equipment costs play a secondary role.


With this in mind, the Delta Hybrid was developed with the focus on increasing energy efficiency and achieving a significant reduction of energy costs and greenhouse gas emissions.


The ideal union of both rotary lobe blower and screw compressor technologies resulted in the Delta Hybrid, a future-oriented innovation that reduces the energy consumption by up to 15% compared to usual compressors.



Average operating costs of an air mover over 10 years:

 energy

 initial cost

 maintenance



Highest energy efficiency and lower Life Cycle Costs

- Innovative rotary-lobe compressor stage with new rotor profiles
- Increase of energy efficiency up to 15%
- Reduction of package pressure losses
- High volume-flow control range from 25% to 100%
- Belt drive to exactly meet the performance requirements
- Reduction of maintenance costs

Further measures that improve energy efficiency

- Inlet cone that reduces pressure losses (patent pending)
- Optimal air flow within the acoustic enclosure, brings cool air to the intake side and increases compression efficiency
- Silencer without absorption material and with reduced pressure losses (patent pending)
- Shaft-driven or electric motor driven ventilation fan for the acoustic enclosure
- Special silencer insulation reduces the temperature within the acoustic enclosure and contributes to an increase of compression efficiency
- Highly efficient motors EFF1/IE2 motors (Standard) or Premium Efficiency/IE3 motors (Option)
- Power fluctuations even under varying inlet temperatures (summer/winter operation) are minimal compared to turbo compressors.



Reliability and Durability

Following extensive field tests under harshest operating conditions and after over three years of operation in various applications, the Delta Hybrid packages are ready for their market introduction.

In wide-ranging research, Aerzener Maschinenfabrik developed new seal solutions at the drive shaft and at the rotor chamber to minimize the natural wear. A new Aerzen patented bearing system extends the bearing life LH 10 to over 60 000 operating hours (at a differential pressure of 1000 mbar / 15 psi).

As in previous generations, the Delta Hybrid features a purely reactive discharge silencer.

Since absorption material breaks down over time, Aerzen has avoided its use to prevent contaminating the downstream process system.

This makes it suitable for use in pneumatic conveying systems for bulk materials in the food industry.

This avoids any accumulation of broken-down absorption material in the fine diffuser systems of wastewater treatment plants, therefore preventing clogging, high cleaning costs and possibly reducing plant operating capacity.



Reliability and Durability

- Unique combined experience in the design and production of rotary lobe blowers since 1868
- Tested under harshest operating conditions
- Wear minimization in the compressor stage
- Patented bearing extends significantly the service life
- Discharge silencers without absorption material
- Discharge silencer designed as spark arrester certified for ATEX-application



The patented bearing of the Delta Hybrid packages has a life LH 10 exceeding 60 000 hours ($\Delta p = 1000 \text{ mbar} - 14.5 \text{ psi}$)

Expanded operating and increased pressure ranges

By design, conventional rotary lobe blowers are limited to a differential pressure of 1 bar (15 psi). When it comes to higher pressures, other types of compressors are used. These are often designed for significantly higher pressures and at higher initial investment.

The new Delta Hybrid now closes this gap with a differential pressure capability of 1.5 bar (22 psi). Vacuum operation can now be extended from -500 mbar (-1 5"Hg) to -700 mbar (-21 "Hg).

In addition, the discharge temperature limit of the Aerzen Rotary Lobe Compressor has been increased. The Delta Hybrid provides higher reliability under high ambient temperatures and high differential pressures in positive or negative pressure applications; it can now operate safely at discharge temperatures of 160 to 180 °C (320 to 356°F).



Expanded operating and increased pressure ranges

- Increased differential pressures to 1.5 bar (22 psi)
- Increased vacuum capability to -0,7 bar (- 21"Hg)
- Increased maximum allowable discharge temperature
- New rotor profiles matching the pressure range
- High thermal stability



Space saving, easy to use and reduced maintenance costs

In the design phase of the Delta Hybrid, much importance has been given to easy handling and reduction of maintenance costs:

- Side-by-side installation
- Ease of transportation with hand truck or forklift truck
- Integrated service kit with motor lifting jack, filling funnel and first oil fill
- The front side is used for operation and maintenance
- Fully automatic and maintenance-free belt tension provided by hinged motor support base
- Oil level can be monitored from the outside during operation, without interrupting production



Space saving, easy to use and reduced maintenance costs

- Increased bearing life LH 10 to over 60 000 hours (at 1000 mbar / 15 psi differential pressure)
- Extension of oil change intervals to 16 000 operating hours (when using Aerzen oil Delta Lube). No need for a first oil change (for example after the first 500 O.H.)



Low noise levels, discharge silencer without absorption material

Aerzen already set new low machine noise emission standards with its previous Delta Blower Generation 5. The same levels can of course be reached with the Delta Hybrid that is also characterized by further developments:

- New pulsation reduction in the compressor stage
- Discharge silencer without absorption material
- Discharge silencer shell insulation
- New suction cone for lower inlet noise level
- Optimized acoustic enclosure



The innovative rotary lobe compressor

Delta Hybrid



Scope of supply

- Newly designed Rotary Lobe Compressor
- Discharge silencer integrated in base frame
- Combined filter and silencer with inlet cone
- High efficiency electric motor
- High-performance belt drive
- Hinged motor plate
- Connecting housing with check valve
- Pressure safety valve
- Flexible pipe connector with clamps / or flanged expansion joint

Accessories

- Acoustic enclosure for indoor or for outdoor installation
- Cooling fan: shaft or electric motor driven
- Start unloading
- Aerzen controller AERtronic or gauges

Modifications and upgrades

- ATEX certification
- ASME, GOST, China License certification
- All-in-one-solution with integrated starter panel
- Separate control panel
- Frequency inverter



Aerzen controller AERtronic

The new Aerzen AERtronic controller is based on a modular design approach and offers a solution tailored to each individual application.

The controller includes an intuitive touch screen, the base module as well as application dependent add-on modules.

All measured operating data are retrievable and parameters adjustable in a user-friendly menu structure. The base unit used across the Aerzen product range includes the following features:

Processor unit, oil level control, inlet and discharge pressure, motor temperature and speed, three free digital inputs, a relay output, and bus communication interface with control panel and expansion modules.

The expansion module offers three digital inputs and three relay outputs as well as inputs for temperature and pressure measurements (for example oil temperature, compressor outlet temperature, oil pressure). Additional digital inputs, relay outputs, Pt 1000 and analogue inputs and outputs for pressure or temperature control with use of a VFD, as well as bus interface for communication with a master controller or other systems and for data communication can be provided with additional application-related expansion and special modules.



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