

ROTARY LOBE COMPRESSORS

DELTA HYBRID

For intake volume flows from 110 m³/h to 9,000 m³/h



AERZEN

DELTA HYBRID. EFFICIENCY AS PRINCIPLE IN COMPRESSOR TECHNOLOGY.

- Extraordinary energy efficiency
- Reduced life-cycle costs
- Greatly increased range of applications and pressures
- High levels of reliability, long service life
- Reduced maintenance needs
- Processed air 100% free of oil and absorption materials
- Made by AERZEN

The Best of Both Two Worlds.

Compressing air and gas is energy-intensive. No wonder that the call for energy-efficient technology is growing louder. AERZEN's answer: the Delta Hybrid. This latest generation of compressor units from AERZEN incorporates a new principle in compressor technology. The Delta Hybrids are the world's first series of rotary lobe compressors – and up to now the only one

– to combine the advantages of blower and compressor technologies in a single system. The results open up whole new possibilities in positive and negative pressure production. With seven patents and patent applications, Delta Hybrid is one of the most innovative solutions in compressor technology. And far and away one of the most efficient for a broad control range of 25 to 100 percent.



SAVING ENERGY: A GOOD IDEA FOR YOUR BOTTOM LINE, A GOOD IDEA FOR THE ENVIRONMENT.

About 90% of a compressor's life cycle costs go to energy use*. A huge challenge, especially where ecological demands and global competition require the mobilization of all a company's potential. AERZEN is meeting this challenge with energy savings of up to 15%. Which means the investment will pay for itself after only two years, depending on the volume streams and pressures involved. That's the Delta Hybrid.

Two profiles, one unit.

The Delta Hybrid is the perfect synthesis of rotary lobe blower and screw compressor. The innovative rotary lobe compressor combines two different rotor profiles into a single system: a

twisted 3+3 blower profile, designed for lower pressure differentials up to 800 mbar, plus a 3+4 compressor profile, designed for higher pressures up to 1,500 mbar. The result: a completely new efficiency in pressurized air applications.



Specially designed 3+4 compressor profile with internal compressions for low-pressure applications



3+3 blower profile with twisted rotor profile and patented loading, as well as low pinching losses

Energy efficiency in detail:

- Very high control range of between 25% and 100%
- Patented intake cone to reduce pressure loss
- Optimized airflow in the acoustic hood: allows for the intake of cold air to increase compressor efficiency levels
- Improved fluid dynamics in the intake and outlet openings to optimize airflow in the compressor stage and reduce backflow losses
- Patented muffler that reduces pressure losses – and has no absorption materials whatsoever

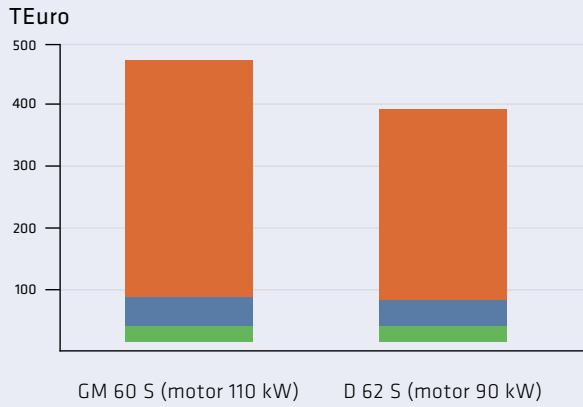
- Acoustic hood ventilator with electric motor
- Special muffler insulation that allows for lower acoustic hood temperatures and higher compressor efficiency (for use at pressures > 1,000 mbar and in exceptional applications)
- Premium Efficiency/IE3 motors
- Minimal performance fluctuations compared to turbo compressors, even with varying intake temperatures (summer/winter operation) or pressure variations
- Belt-driven for precise volume stream determination

Simply clever:

The belt-drive design of the Delta Hybrid has an important advantage: precision configuration. The greatest savings are found in the energy that isn't be used. A deviation of 5% in the volume stream, for example, means an increase in energy consumption of 5%!

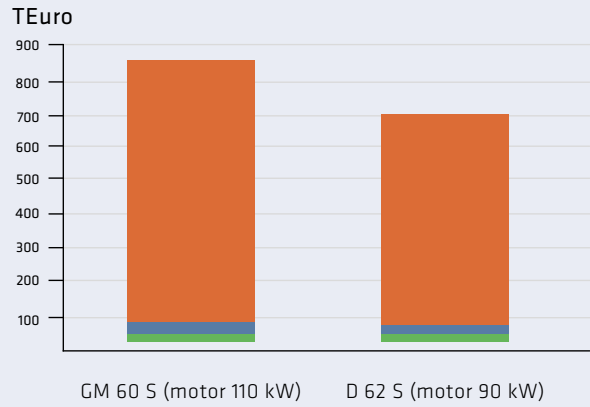
* over a 10-year life cycle

LCC comparison GM 60 S/D 62 S for 5 years of continuous operation



Operating data: 52 m³/min, 900 mbar delta p, 8000 O.H./year
Savings of some Euro 80 K; ROI = 2 years

LCC comparison GM 60 S/D 62 S for 10 years of continuous operation

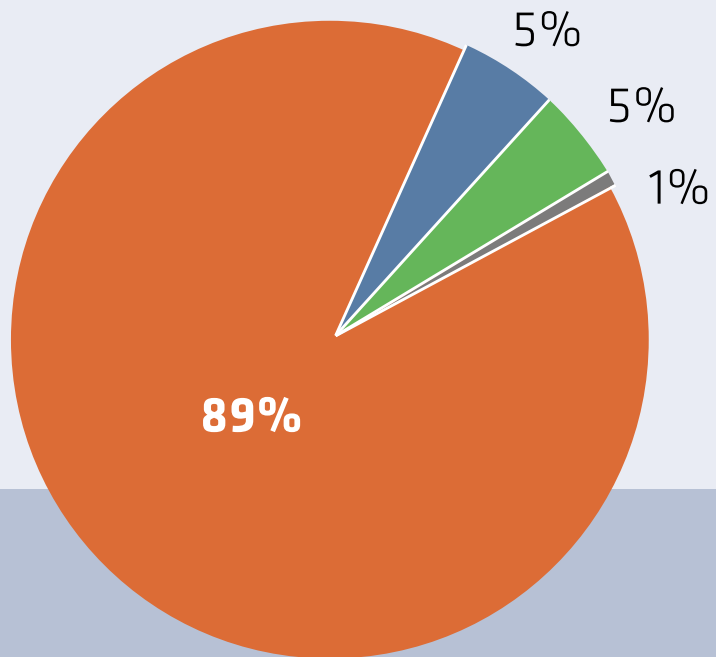


Operating data: 52 m³/min, 900 mbar delta p, 8000 O.H./year
Savings of some Euro 150 K; ROI = 2 years

Lower Life Cycle Costs

Average operating costs of an air mover over 10 years:

- Energy
- Investment
- Maintenance
- Installation



EXTENDING THE FUNCTIONAL RANGE. FOR A WIDE VARIETY OF APPLICATIONS.

The Delta Hybrid is used in a wide range of key industrial applications. These units are designed for the oil-free conveyance of air and neutral gases. For positive and negative pressure use in nominal widths from DN 100 to DN 300.

Extended pressure ranges. More opportunities.

These versatile units can extend the application range to pressures of up to 1,500 mbar (Model H). The range can be extended into negative pressure areas as well, from the usual -500 mbar down to -700 mbar (Model E). This means that the Delta Hybrid has closed the gap in existing machine mixes. Note: because the design of conventional rotary lobe blowers limits them to a maximum pressure differential of 1,000 mbar, other types of compressors had to be used for higher pressure ranges. They were, however, often designed for markedly higher pressures, which also meant higher investment costs.

Higher temperatures, greater safety.

Delta Hybrid rotary lobe compressors can be used anywhere – even in areas with extremely high ambient temperatures. Or for applications with extremely high intake temperatures. The Delta Hybrid can handle outlet temperatures ranging from 160° C to 230° C. A must for operational safety in all processes.

AERZEN Engineering.

Its flexible modular design means that Delta Hybrids can be designed or retrofitted for all rotary lobe compressors and belt-driven motor sizes within a given range of nominal widths. If a standard solution won't do the job,

AERZEN will develop custom products or special machine configurations – always with the idea of making performance as efficient as possible for all your process requirements.



Perfect for pneumatic applications



A powerful tool for vacuum production



Applications

- Sewage treatment
- Drinking water purification
- Pneumatic conveyance of bulk materials (vacuum/pressure pneumatics)
- River and lake aeration and many more

Industries

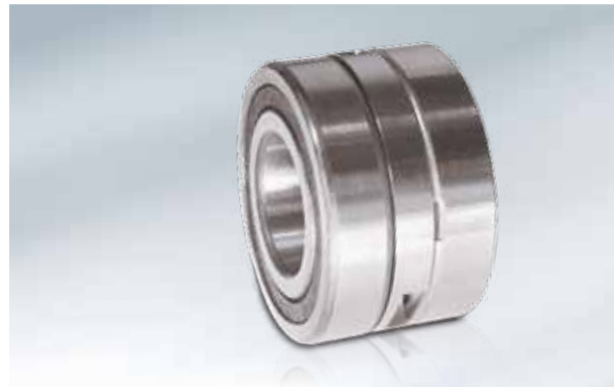
- Sewage treatment
- Chemical and process technology
- Glass and paper manufacturing
- Food industry
- Environmental technology and many more

DECADES OF DEPLOYMENT DISTILLED INTO A SINGLE PHRASE: MADE BY AERZEN.

A high degree of operational safety and a long compressor service life are the basis for AERZEN's reputation in the world today. And make no mistake: these criteria apply to our latest Delta Hybrid series as well. Field-tested extensively during development and with years of daily use to point to, the Delta Hybrid is synonymous with AERZEN quality.

No absorption material to interrupt operation.

Absorption materials cause wear and are a hazard to operational safety. This is why AERZEN R&D came up with a special patented solution: a discharge muffler completely free of absorption material. It decreases noise purely by rerouting air flow, guaranteeing that downstream process systems won't be contaminated. In sewage treatment technology, this means that clogs in the aeration system can be avoided, and with it limits to operation and high maintenance costs. In the pneumatic conveyance of bulk materials, it means that it is safe to use with foodstuffs.



Patented Delta Hybrid bearings

Extending operational lifespans.

Longevity results from carefully selected materials and quality workmanship. But it is also the result of extensive development work. And for the Delta Hybrid, this also means special

seals for the motor and conveying chamber to minimize wear. Another example is the patented AERZEN bearings. Even at pressure differentials of 1,000 mbar, they have an increased nominal lifespan of more than 60,000 hours Lh10.

.783 h

4.762.239 h

236.854 h

2.489.237 h

3.256.489 h

*At the heart of today's compressor processes:
the Delta Hybrid unit*



Made in Germany – by AERZEN.

The Delta Hybrid and its basic components – from the assembly as a whole right down to the operating system – are all made by AERZEN, a family firm in the best German tradition.

This means that the company will always meet its own high standards of quality, without exception. And that only optimal designs are put into operation. That's the only way that we can guarantee the reliability and high productivity of our systems.

A reliable partner, the world over.

Long service life and low maintenance costs – these are the hallmarks of all our products. Should there come a time when you need us, though, we are there for you. With more than 2,000 employees in over 40 offices around the world, with representatives in over 100 countries on every continent. Real-life reliability.



DRIVING PROCESSES ECONOMICALLY. FROM OUR INSTALLATION TO YOUR SATISFACTION.

Easy handling, minimal maintenance: these are characteristics that have a direct impact on efficiency and your bottom line. A good reason why AERZEN kept them in mind when it developed the Delta Hybrid generation. The results will be convincing even for hard-nosed accountants – and will be a joy to use in day-to-day operation.

Extremely compact design

- Space-saving side-by-side setup
- Smaller engine rooms
- Easy access for service and maintenance work

Easy to transport

- With palette truck or fork lift
- Improved safety with innovative hinged motor mounting plate lifting jack

Plug & Play

- 100% pre-configured unit
- Ready to run
- Integrated service package with funnel and first oil fill

Comfortable control design

- Control and maintenance take place at the front of the machine
- Oil levels can be checked during operation without having to interrupt production

Belt drive and hinged motor mounting plate

- Fully automatic and maintenance-free belt tensioning
- No need to monitor V-belt tension
- Very easy to install or replace V-belts
- Precise configuration
- Later power adjustments can be made easily and quickly

Multifunctional hinged motor mounting plate lifting jack

- Makes transport safer
- V-belts safe and easy to install
- Mobile installation
(e.g. aboard ship/in earthquake zones)
- Can be used as a baseplate support for heavy motors





Smart oil system

- Time between oil changes doubled: now up to 16,000 hours of operation
- Initial oil change no longer necessary (had been at 500 hours after start of operation)
- Oil levels can be checked during operation: meter can be read from the operating side
- Robust mechanical oil pump: starts pressurizing oil when main motor is turned on
- Oil instead of grease. Bearings lubricated with oil (oil injection) last longer.
- No need for a separate oil cooler. No oil cooler contamination. No additional component to maintain.
- No need for additional motor. A plus for energy efficiency.

100% oil-free (per Class 0)

- Oil-free processed air for sensitive applications (e.g. in the food and chemical industries)
- TÜV certified per ISO 8573-1 Class 0

Intelligent noise reduction

- Patented discharge muffler with no absorption material
- Noise reduction exclusively through air deflection
- Innovative pulsation reduction in the compressor stage
- Patented intake cone to reduce intake noise
- Optimized acoustic hood

ATEX certified

- Discharge muffler certified as spark extinguisher for ATEX applications

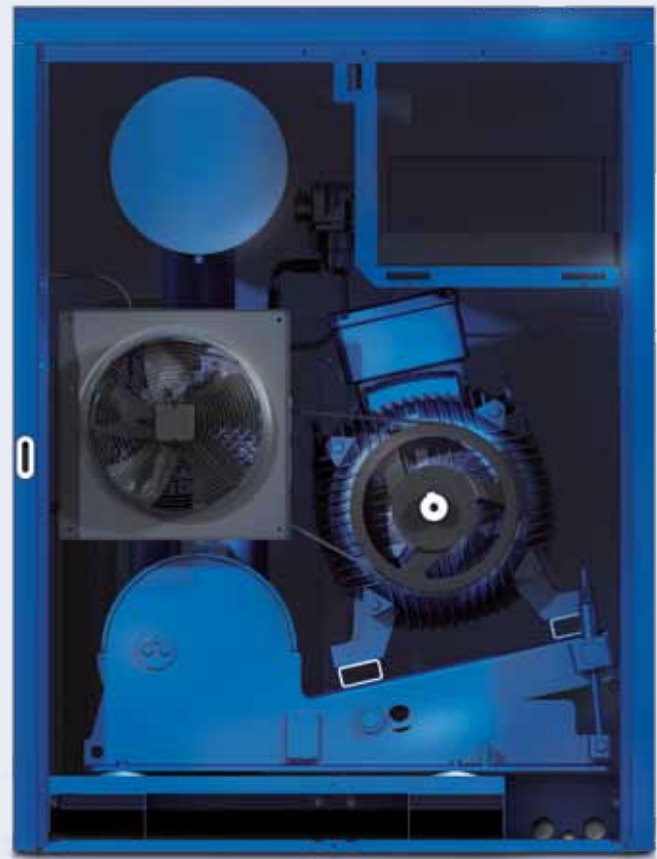
Approved for use per PDE guidelines (pressure valve)

PRESSURE ASSEMBLY DOESN'T GET ANY EASIER.

Another thing that saves on resources: Delta Hybrid units are delivered ready-to-run. The effort that went into their engineering, their optimal configuration, the way they are designed for your processes: all this happens at AERZEN prior to delivery. We call this kind of delivery “all inclusive”. Which means that there is no easier way to provide high-quality, ready-to-run compressor technology.

Plug-and-run configuration: the deliverables.

- AERZEN rotary lobe compressors with integrated oil system:
 - Flange-mounted, mechanical oil pump (except in Model D 62/75)
 - Pressurized oil lubrication for long bearing life
 - No separate oil cooler needed
 - Wear-resistant seals for drive shaft and conveyance chamber
- Electrical vacuum generator for safe oil chamber ventilation
- Hinged motor mounting for optimal, automatic V-belt tensioning
- Multifunctional hinged motor mount lifting jack
- High-performance narrow V-belt drive
- Three-phase AC motor, maximum efficiency Class IE3
- Base support with integrated discharge muffler (with no absorption material)
- Vibration dampening, flexible machine mounts
- Connection housing complete with non-return valve
- Flexible rubber bushing with clamps or flange compensator
- Pressure valve per PED requirements
- Pressure and temperature sensors fully connected and wired
- Display instruments
- Filter mufflers with integrated filter cartridge
- Complete documentation



Intelligent additions: the accessories

- Acoustic hood with electric ventilation for interior or exterior installation, per ErP Directive 2005/32/EC
- Startup load relief (necessary for delta-star operation)
- AERtronic, the electronic AERZEN control system (standard in H models) for efficient and safe

- operation. Monitors and displays intake and final pressures, oil pressure, oil levels, as well as final temperature and oil temperature
- 1-year, 2-year or 5-year service packages



Easy to maintain: AERZEN air filter cartridge



Always the right choice: original AERZEN replacement parts



Easy to use: multifunctional hinged motor mount lifting jack from AERZEN

Modifications and extensions:

- ASME, TR, and China License certification available
- ATEX-compliant design
- Acoustic hood with special sand collector for use in desert locations
- Acoustic hood for use in areas prone to earthquakes and high winds
- Acoustic hood for low temperatures (to -40° C) with heater and gravity-activated blinds
- For use aboard ships
- All-in-one solution with integrated power cabinet (frequency inverter, delta-star, direct drive, soft start)
- Separate control cabinet (frequency inverter, delta-star, direct drive, soft start)
- Custom finishes
- Additional accessories or modifications on demand

DELTA HYBRID BY THE NUMBERS. PLANNING FOR INCREASED COMPRESSOR PROCESS EFFICIENCY.

The innovative Delta Hybrid series of rotary lobe compressors comes in models H, S, L, and E. And in 14 different sizes. For intake volume streams from about 110 to 9,000 m³/h, positive pressures up to 1,500 mbar, and negative pressures down to -700 mbar. A broad spectrum of machines designed to meet the exacting requirements of a wide variety of processes.

Performance data (Technical data subject to change – product subject to technological change).

Overpressure				
Size	Differential pressure max. mbar	Volume flow max. m ³ /h	Motor power max. kW	Noise pressure level max. dB (A)*
D 12 H	1,500	670	37	73
D 12 S	1,000	690	30	72
D 17 L	800	810	30	66
D 24 H	1,500	1,370	75	76
D 24 S	1,000	1,390	55	74
D 28 L	800	1,340	45	70
D 36 H	1,500	1,900	110	76
D 36 S	1,000	2,150	75	76
D 46 L	800	2,350	75	70
D 62 H	1,500	3,400	160	81
D 62 S	1,000	3,500	110	79
D 75 L	800	3,870	132	77
D 98 H	1,500	5,600	250	81
D 98 S	1,000	5,800	200	79
D 152 H **	1,500	8,700	400	81
D 152 S **	1,000	8,900	315	80

Underpressure				
Size	Differential pressure max. mbar	Volume flow max. m ³ /h	Motor power max. kW	Noise pressure level max. dB (A)*
D 12 E	-700	650	18,5	72
D 24 E	-700	1,320	37	73
D 36 E	-700	2,000	55	76
D 62 E	-700	3,300	90	79
D 98 E	-700	5,500	132	78
D 152 E**	-700	8,500	160	79

* Machine emitted noise with acoustic hood and with connected and insulated piping, tolerances ± 2 dB(A)

** In preparation

Dimensions and weights (Technical data subject to change - product subject to technological change).



Delta Hybrid.

Size	H	D	W	Nozzle size DN	Weight with acoustic hood
D 12 H/S/E	1.500	1.350	1.250	100	590 kg
D 17 L	1.500	1.350	1.250	125	600 kg
D 24 H/S/E	1.500	1.350	1.250	125	635 kg
D 28 L	1.500	1.350	1.250	125	573 kg
D 36 H/S/E	1.980	1.800	1.500	150	1.098 kg
D 46 L	1.980	1.800	1.500	150	1.590 kg
D 52 S	1.980	1.800	1.500	150	1.230 kg
D 62 H/S/E	2.111	2.055	1.700	200	1.530 kg
D 75 L	2.345	2.200	1.900	250	1.900 kg
D 98 H/S/E	2.345	2.200	1.900	250	2.100 kg
D 152 H/S/E*	2.345	2.850	2.100	300	3.500 kg

Weight without motor/ In preparation*

Delta Hybrid with integrated power supply.

Model	H	D	W	A	B	Nozzle size DN	Weight with acoustic hood
D12 S-H-E	1,500	1,350	1,850	311	375	100	740 kg
D17 L	1,500	1,350	1,850	311	375	125	750 kg
D24 S-H-E	1,500	1,350	1,850	311	375	125	785kg
D28 L	1,500	1,350	1,850	311	375	125	723 kg
D36 S-H-E	1,900	1,800	2,100	377	435	150	1,400 kg
D46L	1,900	1,800	2,100	377	435	150	1,400 kg
D62 S-H-E	2,111	2,055	2,300	376	525	200	1,880 kg

Weight without motor, electrical power supply and belt drive

Explanation of type codes:

Example:

D 62 S



Style:

H = Differential pressures to 1,500 mbar (22 psi)

S = Differential pressures to 1,000 mbar (15 psi)

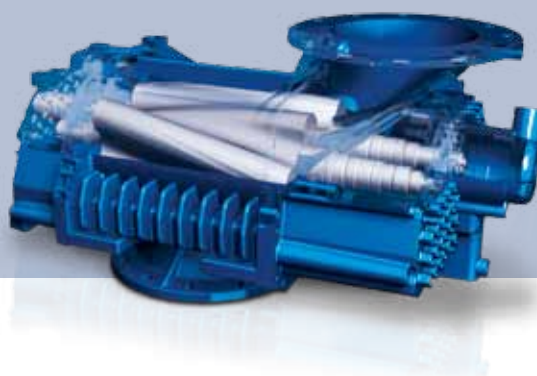
L = Differential pressures to 800 mbar (12 psi)

E = Vacuum design up to -700 mbar (-21 °H)

Max. volume flow in m³/min (approx.)

Rotary lobe compressor

*Innovative insights:
Delta Hybrid stage D75L*



AERTRONIC. INTELLIGENT CONTROL FOR FAST PROCESSES.

Easy to use. With intelligent features. And designed to provide you with the assurance that your facilities will always run at the desired operating point, depending on system pressures and other parameters. During vacuum operation as well, of course. After all, that's why AERZEN designed it in the first place. We're talking about AERtronic, the advanced unit control system from AERZEN.



Focus on operating conditions.

The AERtronic functionalities provide you with a broad range of possibilities for the control, safety, and maintenance of your Delta Hybrid units. It displays operational data, runs the operating hours counter, provides early notifications of operational events, and saves all this information in memory. This means that you can always check on where in the process the unit was at any particular time. Ideal when it comes to targeted corrective responses.

Efficient planning.

How long are the service intervals? When is the next maintenance due? AERtronic will keep you informed about these important cycles. There are two big advantages to this: service calls can be planned more efficiently, and the lifespan of your machine's components can be increased significantly.

*Finding the perfect operating point:
AERtronic, the advanced unit control system*





AERZEN. Compression as success factor.

AERZEN was founded in 1864 as Aezener 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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AERZEN
EXPECT PERFORMANCE