

ROTARY LOBE COMPRESSORS

DELTA HYBRID

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



AERZEN

DELTA HYBRID.

EFFICIENCY AS A 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 material
- Made by AERZEN

The Best of Both Worlds.

Compressing air and gas is energy-intensive. It is no wonder that the demand for energy-efficient technology increases daily. AERZEN's solution: the Delta Hybrid. Our latest generation of assemblies incorporates a new principle in compression technology. The Delta Hybrids are the world's first – and only – series of rotary lobe compressors

that combine the advantages of blower and compressor technologies in a single system. This technology opens up new possibilities in positive and negative pressure production. With seven patents and patent applications, Delta Hybrid is one of the most innovative solutions available in compressor technology. It is far and away one of the most efficient systems for a broad control range of 25 to 100%.



ENERGY SAVINGS: A GOOD IDEA FOR YOUR BOTTOM LINE AND FOR THE ENVIRONMENT.

Nearly 90% of a compressor's life cycle costs go to energy use*. This poses a vast challenge, especially where ecological demands and global competition require the full mobilisation of a company's potential. Offering energy savings of up to 15%, AERZEN is up to the challenge; depending on the volume flows and pressures involved, the investment will pay for itself after only two years. The Delta Hybrid.

Two profiles, one assembly.

The Delta Hybrid is a perfect synthesis of positive displacement blower and screw compressor technology. Our innovative rotary lobe compressor combines two different rotor profiles in 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 is a completely new standard for efficiency in pressurised air applications.



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



3+3 blower profile with twisted rotors and patented pre-compression by pulse-charging as well as reduced losses caused by trapped air in the rotor valleys

Energy efficiency in detail:

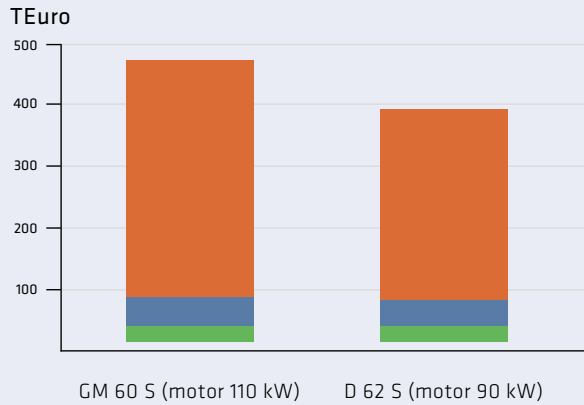
- Improved control range between 25% and 100%
- Patented intake cone to reduce pressure loss
- Optimised airflow in the acoustic hood allows for the intake of cold air to increase compressor efficiency levels
- Improved fluid dynamics in the intake and outlet openings to optimise airflow in the compressor stage and reduce backflow losses
- Patented muffler that reduces pressure losses with no absorption materials whatsoever
- Acoustic hood ventilator with electric motor
- Special silencer insulation 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 flow determination

Simply smarter.

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 used. A deviation of 5% in the volume flow, for example, means an increase in energy consumption of 5%!

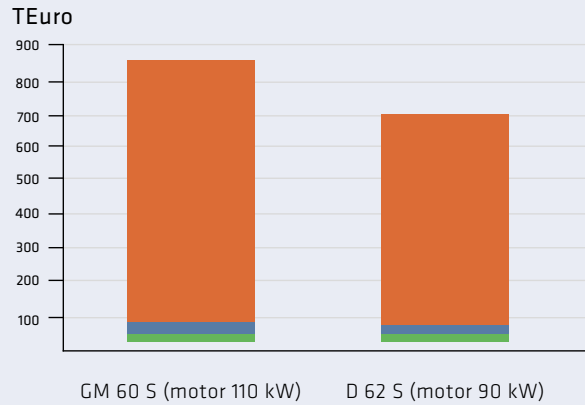
* over a 10-year life cycle

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 nearly 80K in Euro; ROI = 2 years

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

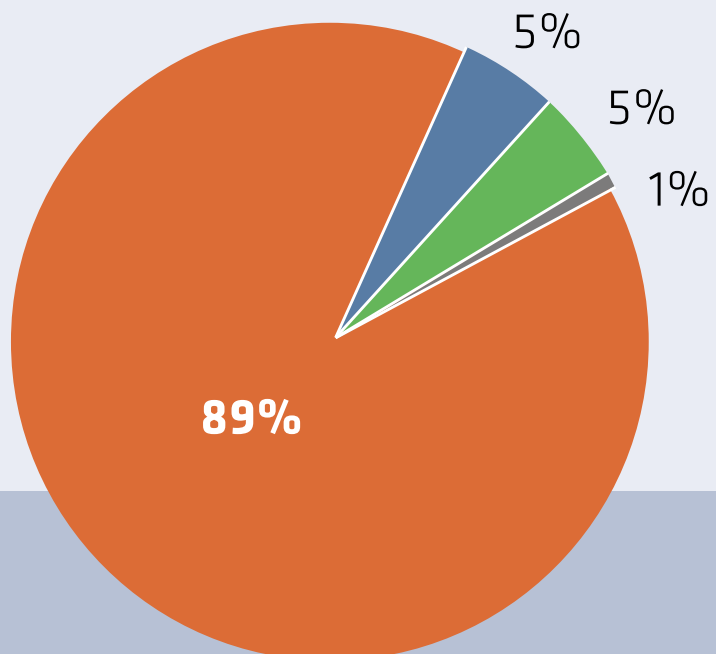


Operating data: 52 m³/min, 900 mbar delta p, 8000 O.H./year
Savings of nearly 150K in Euro; ROI = 2 years

Lower Life Cycle Costs

Average operating costs of an air compressor over 10 years:

- Energy
- Investment
- Maintenance
- Installation



EXTENDING THE FUNCTIONAL RANGE FOR A WIDE VARIETY OF APPLICATIONS.

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

Extended pressure ranges. Greater opportunities.

These versatile assemblies expand the application range to pressures of up to 1,500 mbar (Model H). The range can be expanded 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 current hybrid machines. Note: because the design of conventional positive displacement blowers limits them to a maximum pressure differential of 1,000 mbar, other types of compressors were previously required 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 application 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 the Delta Hybrid can be designed or retrofitted for all rotary lobe compressors and belt-driven motor sizes within a 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 goal of optimising efficiency 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

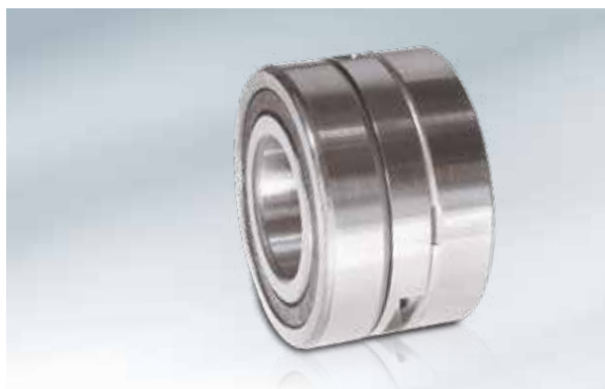
- Sewage treatment
- Chemical and process technology
- Glass and paper manufacturing
- Food industry
- Environmental technology
- and many more

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

A high degree of operational safety and an extended compressor service life set the foundation for AERZEN's global reputation today. And make no mistake: these criteria apply to our latest Delta Hybrid series as well. Field-tested extensively in development and with years of daily use to back it up, the Delta Hybrid is synonymous with the quality that customers have come to expect from AERZEN.

No absorption material to interrupt operation.

Absorption materials cause wear and are a hazard to operational safety. To solve this, 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 avoids clogs in the aeration system, and with them operational constraints and high maintenance costs. In the pneumatic conveyance of bulk materials, it also means that it is safe to use with foodstuffs.



Patented Delta Hybrid bearings

Extended operational lifespans.

Long service life begins with carefully selected materials and quality workmanship. But it is also the result of extensive development work. For the Delta Hybrid, it also means special

seals for the motor and conveying chamber to minimise wear. Our patented AERZEN bearings provide another example. Even at pressure differentials of 1,000 mbar, they have an increased nominal lifespan of more than 60,000 hours $L_{h_{10}}$.

.783 h

4,762,239 h

2,489,237 h

236,854 h

3,256,489 h

*At the centre of today's compression processes:
the Delta Hybrid package*



Made in Germany by AERZEN.

The Delta Hybrid and its basic components – from overall assembly to its operating system – are all made by AERZEN, a family-owned company carrying forward in the best German tradition. This means that the company will meet its own high standards of quality without exception, and that only optimal designs are used. It's the only way to consistently ensure 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 our products. Whenever you need us we'll be there for you: more than 2,000 employees in 50 subsidiaries around the world, with representatives in over 100 countries on every continent. Proven reliability.



ECONOMICAL PROCESS MANAGEMENT. FROM OUR INSTALLATION TO YOUR SATISFACTION.

Easy handling, minimal maintenance: these characteristics have a direct impact on efficiency and the bottom line. It is with good reason that AERZEN kept them in mind when it developed the Delta Hybrid generation. The results are convincing, even for hard-nosed accountants, and are a delight in day-to-day operation.

Extremely compact design

- Space-saving side-by-side installation
- Smaller machine rooms
- Easy access for service and maintenance work

Easy to transport

- With pallet 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
- Easy to install or replace V-belts
- Precise configuration
- Subsequent power adjustments 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 (previously 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: begins to pressurise 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 silencer with no absorption material
- Noise reduction occurs exclusively through air deflection
- Innovative pulsation reduction in the compressor stage
- Patented intake cone to reduce intake noise
- Optimised acoustic hood

ATEX certified (optional)

- Discharge silencer certified as spark extinguisher for ATEX applications

Approved for use per PED directive (pressure valve)

PRESSURE BUILD-UP AT ITS EASIEST.

Another advantage that saves on resources: Delta Hybrid packages are delivered ready-to-run. The effort that went into their engineering, their optimal configuration, their process-specific design: all this happens at AERZEN prior to delivery. We call this kind of delivery 'all inclusive'. It means that there is no easier way to provide high-quality, ready-to-run compressor technology.

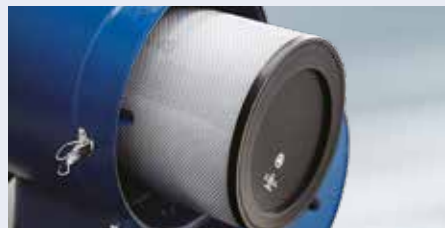
Plug & Play configuration: the scope of delivery.

- AERZEN rotary lobe compressors with integrated oil system:
 - Flange-mounted, mechanical oil pump (except in Model D 62/75)
 - Pressurised oil lubrication for long service life
 - No separate oil cooler needed
 - Wear-resistant seals for drive shaft and conveying chamber
- Electrical vacuum generator for safe oil chamber ventilation
- Hinged motor mounting plate for optimal, automatic V-belt tensioning
- Multifunctional hinged motor mounting plate lifting jack
- High-performance narrow V-belt drive
- Three-phase AC motor, maximum efficiency Class IE3
- Base support with integrated discharge silencer (no absorption material)
- Vibration dampening, flexible machinery 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 silencer with integrated filter cartridge
- Complete documentation



Intelligent additions: the accessories

- Acoustic hood with electric ventilation for indoor or outdoor installation, per ErP Directive 2005/32/EC
- Start unloading device (necessary for star-delta 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, 2 or 5-year service packages



Easy maintenance: AERZEN air filter cartridge



Always the right choice: original AERZEN spare parts



User-friendly: multi-functional hinged motor mounting plate lifting jack from AERZEN

Modifications and extensions:

- ASME, TR, and China License certifications available
- ATEX-compliant design
- Acoustic hood with special sand collector for use in desert locations
- Acoustic hood for use in earthquake zones and high winds
- Acoustic hood for low temperatures (to -40° C) with heater and gravity louver blinds
- For use aboard ships
- One-stop solution with integrated power cabinet (frequency converter, star-delta, direct drive, soft start)
- Separate control cabinet (frequency converter, star-delta, direct drive, soft start)
- Custom finishes
- Additional accessories or modifications on demand

DELTA HYBRID BY THE NUMBERS.

PLANNING FOR INCREASED COMPRESSION PROCESS EFFICIENCY.

Our innovative Delta Hybrid series of rotary lobe compressors comes in H, S, L, and E models and in 11 different sizes. For intake volume flows from around 110 to 9,000 m³/h, positive pressures up to 1,500 mbar, and negative pressures down to -700 mbar. The Delta Hybrid series encompasses a broad spectrum of machines designed to meet the exacting requirements of a wide variety of processes.

Dimensions and weight (Technical data subject to change, product subject to 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 52 S	1,000	3,120	110	77
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

Negative pressure				
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)

Dimensions and weight (Technical data subject to change, product subject to change).



Delta Hybrid.

Size	W	D	H	Nozzle size	Weight with acoustic hood kg
	mm	mm	mm	DN	
D 12 H/S/E	1,250	1,350	1,500	100	590
D 17 L	1,250	1,350	1,500	125	600
D 24 H/S/E	1,250	1,350	1,500	125	635
D 28 L	1,250	1,350	1,500	125	573
D 36 H/S/E	1,500	1,800	1,980	150	1,098
D 46 L	1,500	1,800	1,980	150	1,590
D 52 S	1,500	1,800	1,980	150	1,230
D 62 H/S/E	1,700	2,055	2,111	200	1,530
D 75 L	1,900	2,200	2,345	250	1,900
D 98 H/S/E	1,900	2,200	2,345	250	2,100
D 152 H/S/E*	2,100	2,850	2,345	300	3,500

Weight without motor/* In preparation

Delta Hybrid with integrated power supply.

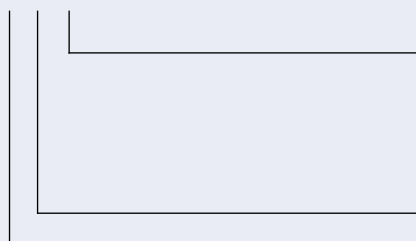
Model	W	D	H	A	B	Nozzle size	Weight with acoustic hood kg
	mm	mm	mm	mm	mm	DN	
D 12 S-H-E	1,850	1,350	1,500	311	375	100	740
D 17 L	1,850	1,350	1,500	311	375	125	750
D 24 S-H-E	1,850	1,350	1,500	311	375	125	785
D 28 L	1,850	1,350	1,500	311	375	125	723
D 36 S-H-E	2,100	1,800	1,900	377	435	150	1,400
D 46 L	2,100	1,800	1,900	377	435	150	1,400
D 52 S	2,100	1,800	1,900	377	435	150	1,400
D 62 S-H-E	2,300	2,055	2,111	376	525	200	1,880

Weight without motor, electrical power supply and belt drive

Explanation of model names:

Example:

D 62 S



Style:

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

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

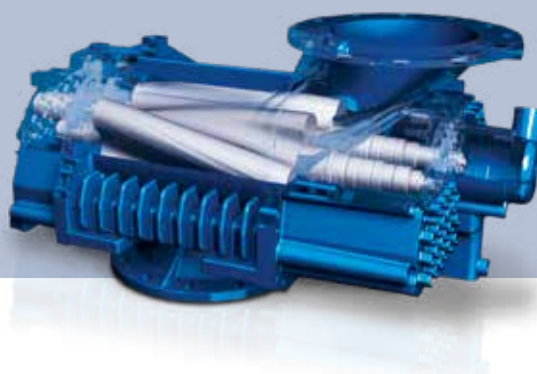
L = Differential pressures to 800 mbar (12 psi)

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. Intelligent features. Designed to provide you with the assurance that your facilities will always operate optimally, 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 assembly control system from AERZEN.



Focused on operating conditions.

AERtronic's functionalities provide you with a broad range of possibilities for the control, safety, and maintenance of your Delta Hybrid packages. It displays operational data, manages the operating hours counter, provides early notifications of operational events, and stores all this information in its memory. This means that you can check on where in the process the assembly was at any particular time, making it ideal for targeted corrective responses.

Efficient planning.

How long are service intervals? When is the next maintenance session due? AERtronic will keep you informed about these important cycles. There are two key advantages to this: maintenance 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 assembly control
system*





AERZEN. Compression - the key to our success.

AERZEN was founded in 1864 as Aerzener Maschinenfabrik. In 1868, we built Europe's first positive displacement blower. The first Turbo blowers followed in 1911, the first screw compressors in 1943, and in 2010 the world's first rotary lobe compressor package. Innovations "made by AERZEN" keep driving forward the development of compressor technology. Today, AERZEN is among the world's longest established and most significant manufacturers of positive displacement blowers, rotary lobe compressors, screw compressors, and Turbo blowers. AERZEN is among the undisputed market leaders in many areas of application.

At our 50 subsidiaries around the world, over 2,000 experienced employees are working hard to shape the future of compression technology. Their technological expertise, our international network of experts, and the constant feedback we get from our customers provide the basis for our success. AERZEN products and services set the standard in terms of reliability, stability of value and efficiency. Go ahead - challenge us!

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AERZEN
EXPECT PERFORMANCE