AERZEN
Screw Compressors

Aerzen Screw Compressor VARISCREW for the refrigeration industry
Aerzener Maschinenfabrik was founded in 1864. In 1868, Aerzen produced Europe's very first rotary piston machine designed according to the Roots principle. The manufacture of rotary piston gas meters began in 1930, followed by the instruction of the first rotary screw compressor in 1943.

Experience in the production of twin shaft rotary lobe machines is also reflected in quality assurance. Since 1990, Aerzener Maschinenfabrik counts itself among the manufacturers whose quality assurance has been certified acc. to ISO 9001, world-wide.

Dedicated to constant technological progress, Aerzen has evolved into a modern enterprise and a world leader in the field of specialized machine engineering. The steady growth of our staff, presently counting over 1000 experienced engineers, technicians and craftsmen ensures Aerzen's leading position. The excellence of Aerzen's sales and service organization is recognized around the world.

As pioneer of the German engineering branch of industry the Aerzener Maschinenfabrik started the development of screw compressors in the thirties.

By constant further development and application of most modern technology the Aerzener Maschinenfabrik succeeded in belonging to today's market leader in the range of oil-free and oil-injected compressors for nearly all gases.

In 25 years of co-operation with the company SABROE more than 3000 screw compressors have been delivered for the refrigeration application in the food industry, pharmaceutical industry, chemical and petrochemical industry, marine refrigeration as well as heat pump and expander for utilization of combustion heat.

The VARISCREW-series in the most different designs will firmly establish itself in the industrial and commercial refrigeration.

A new era in Aerzen's refrigeration history started at the fair IKK'96 in Nuremberg where the new refrigeration compressor series '46 – called VARISCREW – was presented to the general public.
VARISCREW, the new generation of refrigeration compressors made by Aerzener Maschinenfabrik, is part of a wide range of screw compressors providing an individually suitable solution for any customer.

Application of VARISCREW

The VARISCREW-type of compressor has been designed for the capacity range 233 m³/h up to 2,700 m³/h with 50 Hz (280 m³/h up to 2,930 m³/h with 60 Hz).

Main characteristics

- Liquid injection as oil cooling device has been foreseen
- Oval flange
- Length-diameter ratio is equal for all screw compressors
- Optimization of the axial outlet – for COP increase
- Space saving unit assembly due to compact compressor design and low weight
- Automatic V_ref - control (VMY 346)

Advantages of VARISCREW

Where low operation costs and high reliability are basic demands, VARISCREW is the right decision for the entire range of marine and industrial refrigeration.

Application in

- meat and poultry industry
- cold storage
- dairies and breweries
- mine cooling
- marine refrigeration
- air conditioning
- process refrigeration
- heat pumps

VMY 046 - VMY 246

VMY 346

vertical cross section

horizontal cross section

1 Housing
2 Male rotor
3 Female rotor
4 Radial bearings
5 Axial bearings
6 Oil injection
7 Mechanical seal
8 Hydraulic thrust capacity control
9 Slide valve
10 Spring
11 Transsonar transmitter
12 V_ref-Adjustment
13 Economizer connection

1 Housing
2 Male rotor
3 Female rotor
4 Radial bearings
5 Axial bearings
6 Oil injection
7 Mechanical seal
8 Hydraulic thrust V_ref-Adjustment
9 Slide valve
10 Transsonar V_ref
11 Transsonar transmitter
12 Oil supply bearings, mechanical seal
13 Economizer connection
14 SOC connection
15 Balancing piston
16 Oil pump
**VARISCREW** offers a concept of economy, environmental attention and flexibility; slide valve or speed control as well as regulation of the internal pressure ratio are just examples.

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**Operational lifetime and costs**

The newly designed rotor profile – another step in development of the existing 4+6 D-Profile – as well as the bearing quality, consequently tested for long lifetime (up to 50,000 hours), prolongate maintenance periods and lower operational costs. An optimal operating safety is guaranteed by a flanged oil pump for lubrication of the compressor (VMY 346).

**Quality**

Now that decades of experience in the manufacture of compressors have been connected with the latest concepts of production and development a refrigeration compressor has been designed that can be operated with all refrigerants presently known. With its certified quality Aerzener Maschinenfabrik is always prepared to meet the customer’s particular demands.

**Compressor size**

Depending on the compressor size a modular system of equipment is available so that the customer’s requirements can be met exactly. As both, male and female rotor drive can be chosen any required conveying volume flow can be achieved on a well-tested serial machine. No costly and complicated case to case developments have to be made.

**Smooth operation, Low noise**

No pending masses influence the operation of these machines. All moving parts are rotating and have been dynamically balanced so that no free inertia forces occur.

The noise level has been minimized by means of absolutely suitable wall thicknesses and axial outlet area.

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**1 Intake**

Gas enters through the gas intake aperture and flows into the helical grooves of the rotors which are open at the intake side.

**2 and 3 Compression process**

As rotation of the rotors proceeds, the gas intake aperture closes, oil is injected, the volume diminishes and pressure rises.

**4 Discharge**

The compression process is completed, the final pressure attained, the discharge commences.

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**Economy, environmental safety and flexibility**

Slide valve or speed control, as well as regulation automatic control of the internal pressure ratio, either with or without motor flange – those are the catchwords for a concept of economy, environmental safety and flexibility.
**VARISCREW** are used for a various range of applications, e.g. from low temperatures, air conditioning plants to refrigeration plants on ships.
a large number of refrigerants can be used:

Refrigerants free from halo: R 717 (NH₃), methane, ethane, propane, butane, CO₂, propene.
Halo carbons: R 22, R 134a, R 507, R 404A

Performance data at 2950 rpm; condensing temperature 35°C; superheating 2 K: subcooling 2 K

![Graphs showing refrigeration capacity for different refrigerants](image-url)
VARISCREW is available in 4 sizes. Alternative use of the male or female rotor drive makes it possible to achieve 8 different intake volumes.

## Technical data

<table>
<thead>
<tr>
<th></th>
<th>VMY 046</th>
<th>VMY 146</th>
<th>VMY 246</th>
<th>VMY 346</th>
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<tbody>
<tr>
<td></td>
<td>HR</td>
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<td>Swept volume</td>
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<td>A mm</td>
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<td>B mm</td>
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<td>C mm</td>
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<td>D mm</td>
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<tr>
<td>Flange Gas-intake</td>
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<td>Flange Gas-discharge</td>
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<tr>
<td>Volume ratio $V_i$</td>
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<td>2,5 - 5,5</td>
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<td>Weight kg</td>
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<td>350</td>
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HR = male drive, NR = female drive
A good address, everywhere

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