

Product profile



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HELICOM CS60 from BITZER: developed for modern, high-performance and resilient data center cooling

Artificial intelligence (AI) applications and high-performance computing are driving power densities in data centers, and with them the demands on heat rejection, to a new level. Standardised and scalable infrastructures that can be deployed reproducibly worldwide are in demand. With HELICOM, BITZER presents a new generation of compact screw compressors for modern data centers that enables scalable cooling concepts worldwide and also takes into account the requirements of future 800 VDC infrastructures.

Drawing on more than 40 years of expertise in screw compressors, BITZER is redefining the technology with HELICOM. The compact screw compressors have been developed to meet the demanding requirements of modern data center cooling. They support reliable heat rejection and contribute to the stable 24/7 operation of IT infrastructure.

New standards for data center cooling

The compact screw compressors of the HELICOM CS60 series support operation with a wide range of refrigerants. This allows the use of all low-GWP refrigerants established in data center cooling, including R1234ze(E), R513A and R515B.

The wide application limits provide flexibility in system design and support cooling solutions for different locations and climate zones with minimal adaptation effort. Standard operating limits with evaporating temperatures of up to +30°C and condensing temperatures of up to +70°C also enable system concepts with heat recovery. Higher evaporating temperatures can also be achieved thanks to the flexible compressor concept.

Product profile



Advanced compressor technology

A key focus during the development of HELICOM was the rotor profile, which was designed using advanced CFD simulations. The optimised internal geometry ensures high volumetric and isentropic efficiency, resulting in high compressor efficiency¹. The optimised rotor profile helps achieve ambitious efficiency targets and low PUE values.

Efficient under all operating conditions

To ensure high energy efficiency under all operating conditions, the compact screw compressors of the HELICOM CS60 series feature a wide capacity modulation range. This enables precise adjustment to actual cooling demand and supports energy-optimised operation even under dynamic IT workloads and varying load conditions.

HELICOM compressors can be operated at fixed speed or with a frequency inverter. A specially developed motor variant enables speeds of up to 4,800 rpm. This allows the compressors to achieve high power density and enables efficient full load and part load operation down to minimum loads of 25%.

Different VI variants enable the internal volume ratio to be matched to the respective operating conditions. This helps maintain efficiency even under varying load conditions.

High performance and operational reliability

HELICOM CS60 compact screw compressors are available with different displacements:

- CS600: 805 m³/h at 50 Hz, 972 m³/h at 60 Hz, 1,305 m³/h at 160 Hz
- CS605: 910 m³/h at 50 Hz, 1098 m³/h at 60 Hz, 1,475 m³/h at 160 Hz

This enables cooling capacities of up to approximately 1,054 kW* (* model: CS605; operating points: $t_o = +25^{\circ}\text{C}$; $t_c = +60^{\circ}\text{C}$ at 160 Hz with R1234ze(E)). Additional capacity increases can be achieved by operating multiple refrigeration circuits in parallel. This increases redundancy, reduces operational risks and supports high system availability.

High availability is further supported by the IQ MODULE CM-SW-02 with a comprehensive sensor package, which is included as standard across the HELICOM series. The module monitors key operating parameters such as pressure, oil and motor temperatures as well as the permissible application limits. This supports predictable operation and the early detection of critical operating

¹ Cf. www.bitzer.de/empc0

Product profile



conditions. At the same time, the IQ MODULE provides comprehensive data for diagnostics and optimisation and enables integration into the system control. The associated BEST SOFTWARE provides an overview of device parameterisation and status.

Oil connection for low-lift operation

The integrated oil connection provides additional benefits for operation with low system pressure differentials. It enables the connection of an oil pump, ensuring oil supply independently of system pressure and thereby supporting operation at very low pressure differentials (low-lift conditions). This helps maintain stable lubrication and oil circulation while extending the application limits. At the same time, dry coolers used in data center cooling can be partially downsized or operated more efficiently than in systems relying solely on free cooling.

Optimally matched: BITZER frequency inverters and heat exchangers

With the VARIPACK frequency inverter and matching heat exchangers, BITZER offers additional components for data center cooling. Together with HELICOM, they enable high-performance and standardised cooling platforms for current and future data center architectures. VARIPACK supports energy-efficient operation across the entire speed range, while the condensers of the KE series and the hybrid falling-film evaporators of the RFV series are designed for high efficiency and the part load operation typical of data centers.



As an independent specialist for refrigeration, air conditioning and heat pump technology, BITZER is present all over the world: with products and services for refrigeration, air conditioning and process cooling as well as transport, BITZER ensures optimum temperature conditions for trade in goods, industry processes and indoor climate control – always striving for the highest possible energy efficiency and quality. BITZER is represented all over the world with 74 sites in 40 countries, including its sales companies and production facilities. Trade and service partners included, the BITZER network of manufacturing, development and sales extends to almost all countries in the world. In 2025, 4,500 employees generated a turnover of €1.135 billion; expenditure for research and development totalled €67 million.

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Product profile



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Image: HELICOM compact screw compressors are designed to meet the requirements of scalable data center cooling