



# Zero oil. Full performance

As the pioneers of oil-free technology, innovation at Danfoss is more than a promise. It's our way of empowering HVAC professionals to drive the market. Building on the proven success of Danfoss Turbocor® compressors, our Extended Oil-free program (EXO) is growing to unlock your full system performance.



# Designed for oil-free. Delivered as a system.

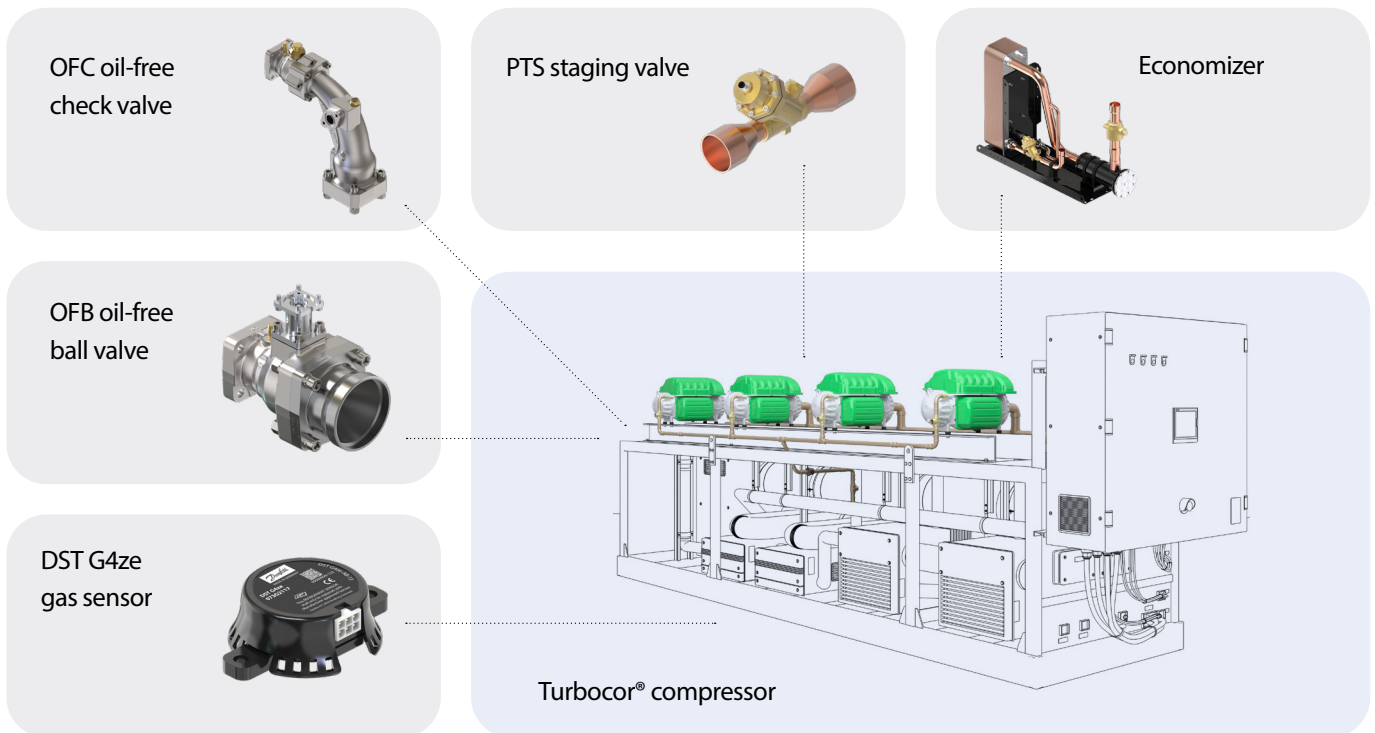
Modern cooling and heating applications demand higher efficiency, wider operating envelopes, and absolute reliability.

Oil-free systems are designed to simplify operation, maintain consistent performance over time, and reduce maintenance requirements. Their characteristics make them particularly well-suited for mission-critical environments such as data centers and high-temperature heat pumps, where reliability and efficiency are paramount.

Danfoss EXO brings together Danfoss Turbocor® oil-free compressors, and purpose-designed oil-free components

build with the latest technological advancements including OFC, OFB, PTS, DST G-series gas sensors, and Economizer. Together, they form a complete ecosystem engineered to preserve efficiency, minimize pressure drop, and ensure long-term reliability.

With up to 45% more capacity at high temperatures and no oil-related performance loss over time, oil-free systems, especially when supported by EXO, enable fewer compressors, simplified system design, lower lifecycle cost, and a future-ready platform for demanding applications.



## A complete portfolio for oil-free systems

In addition to the latest and upgraded core components, dedicated to oil-free systems, Danfoss supports system design with a broad portfolio, including:

- System controllers
- Superheat controllers
- Expansion and solenoid valves
- Pressure controls
- Pressure and temperature sensors
- Filter driers
- Heat exchangers

Together, these technologies enable fully integrated, high-performance oil-free solutions across cooling and heating applications.

[Learn more at oilfree.danfoss.com](https://oilfree.danfoss.com)



# Zero oil. Maximum uptime.

In mission-critical and high-energy-demand applications, the choice of technology directly impacts uptime, efficiency, costs, and sustainability. Danfoss oil-free solutions provide a decisive advantage by eliminating the performance losses, maintenance burdens, and reliability risks inherent in conventional oil-lubricated designs — delivering consistent efficiency, lower operating costs, and future-ready environmental compliance.

## Designed for the future of high-density data centers

Nowhere is this advantage more critical than in data centers, where cooling represents a substantial share of energy consumption.

Danfoss Turbocor® oil-free centrifugal compressors — a benchmark in the industry—are central to this approach. By eliminating oil, they ensure continuous operation without performance degradation over the system's lifetime and deliver outstanding part-load efficiency.

This inherent reliability is bolstered by an ecosystem of protection functions, including better stability at shutdown and liquid migration prevention, that ensure stable performance across all loads and ambient conditions. The result is a direct shift in energy use from cooling losses to valuable computing output. By linking cooling efficiency directly to compute availability, the Danfoss oil-free ecosystem enables scalable, sustainable data center growth with maximum performance and minimal energy waste.

## Application areas include:

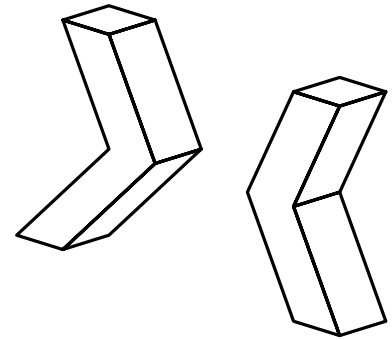
- 01 Data center cooling
- 02 Comfort and process chillers
- 03 Industrial heat pumps
- 04 Heat recovery systems



# Zero oil. Zero friction.

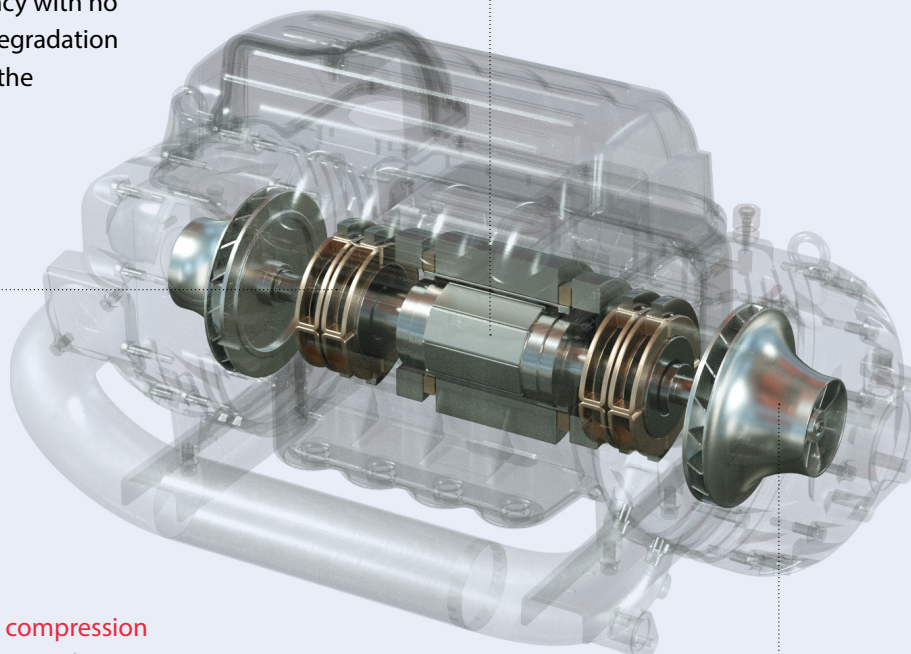
Turbocor® is the world's first oil-free magnetic bearing compressor for the HVAC industry. Its frictionless bearing technology eliminates performance decay, overcoming the limitations of traditional systems and maintaining stable efficiency year after year. Without the need for oil management, complexity of the architecture is reduced with fewer components to maintain.

A chiller using oil-free technology has a simpler design since all the components associated with the oil management system are eliminated. This results in reduced maintenance and higher reliability over the life of the chiller. Turbocor compressors use low-GWP refrigerants such as R1234ze/ R515B, R513A. Also available with R134a.



**Oil-free, magnetic bearings** and integrated variable speed drive delivers industry-leading efficiency with no performance degradation over the life of the compressor.

**Permanent magnet synchronous motor** provides high efficiency and enables compact design.




**Two-stage compression** design provides flexibility to use for water-cooled and air-cooled chiller applications.




Turbocor® with Active Cooling

# Maximized capacity and temperature flexibility for new high-efficiency applications




### Unleash increased capacity

- More capacity at higher temperatures from the same compressor equals faster ROI
- Specialized for demanding high-temp data center cooling at extreme ambient conditions



### Maximum temperature flexibility

- Increased maximum SST enables even higher chilled water temperatures up to 37°C (98.6°F) in data centers
- Active Cooling compressors combine standard and high SST configurations, providing maximum application flexibility
- Saturated discharge temperatures up to 179°F (81.5°C)
- Saturated suction temperatures up to 100°F (38°C) and down to 30°F (-1°C).



### Oil-free heating & heat recovery

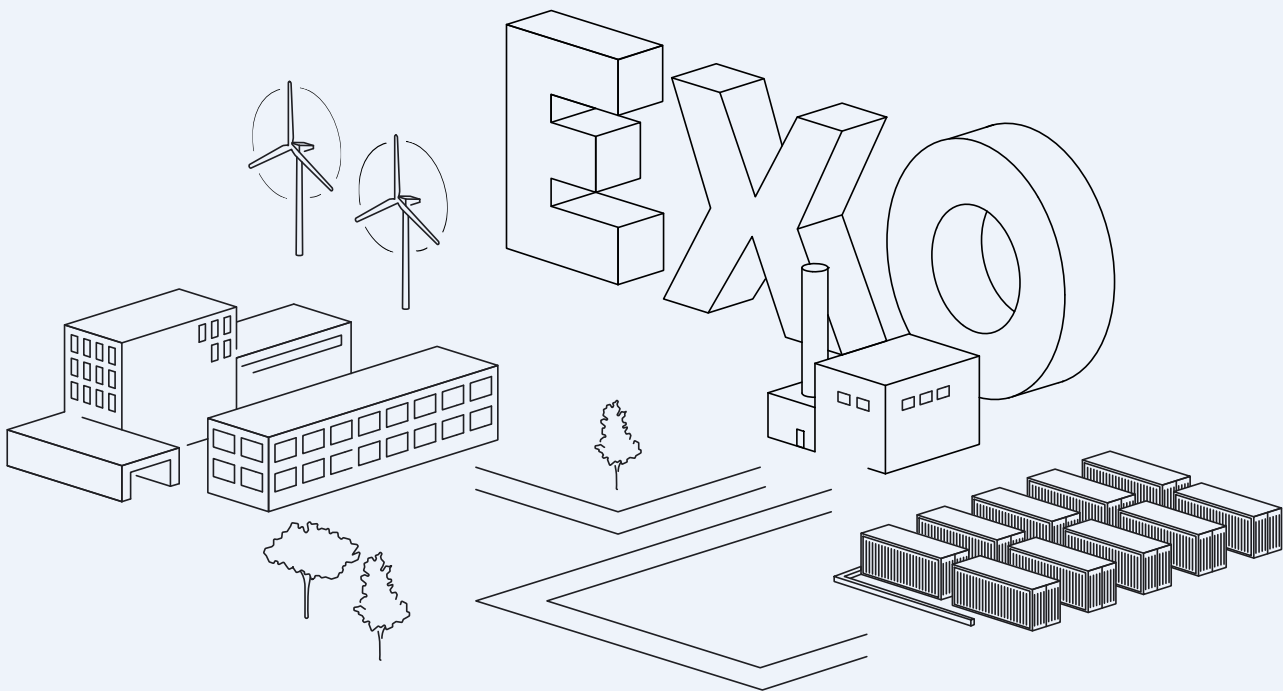
- Electrify heating with industry-leading Turbocor efficiency
- Elevated condensing temperatures for water-to-water heat pumps and heat recovery chillers
- Hot water up to 80°C (176°F)

# Oil-free. Optimized at every level.

Danfoss EXO adds significant value to oil-free systems by enabling reliable performance in high load, high temperature, and challenging ambient conditions often found in data center cooling, industrial processes, and heat recovery applications.

And it's not just the Danfoss Turbocor® compressors that deliver advantages. The Danfoss EXO portfolio includes a range of technologically advanced, oil-free-compatible components designed to work seamlessly in heat pumps and chillers.

**Together, these new and advanced components and services maximize efficiency, reliability, and safety in oil-free systems — making Danfoss EXO the most complete ecosystem for next-generation chillers and heat pumps.**



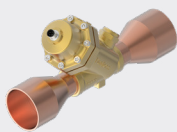
2026 Novelty



**OFC oil-free check valve**

The OFC oil-free check valve is an innovative discharge solution designed specifically for oil-free systems, ensuring low pressure drop for maximum system efficiency. It delivers consistent performance even at low-flow conditions and offers proven reliability in extensive surge applications. Engineered for durability, the OFC guarantees no leakage, especially during service operations, making it a trusted choice for maintaining optimal performance in demanding oil-free chiller and heat pump applications.

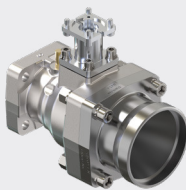
2026 Novelty



**PTS staging valve**

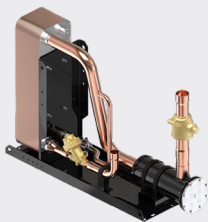
The PTS staging valve safeguards oil-free systems by enhancing system reliability from startup to shutdown. The rapid opening and closing (within 5 seconds) of the PTS valves help reduce the risk of compressor damage, improving overall system reliability. It ensures safe compressor shutdown under all operating conditions, with a high flow capacity range (KV 18–38) to meet diverse application needs. Featuring superior sealing, the PTS valve is a critical component for protecting compressors and maintaining stable, efficient operation in oil-free environments.

2026 Novelty



**OFB oil-free ball valve**

The OFB oil-free ball valve delivers ultra-tight sealing performance for Turbocor® systems, preventing refrigerant liquid migration and ensuring system integrity. Its full-bore valve with a smooth cone design supports optimal flow and efficiency, performing reliably in any climate. A reinforced stem sealing system with strong guide bearings and top-mounted support prevents misalignment and reduces wear, even under demanding operating conditions. Thanks to the valve's low breakaway torque, OFB can be paired with small, very efficient actuators that apply low mechanical stress to the assembly. The complete valve-actuator combination is endurance-tested to 100,000 cycles, ensuring long-lasting and reliable operation throughout the system's lifetime. Rated from -40 °F to +212 °F (-40 °C to +100 °C), the OFB is built to withstand extreme conditions while maintaining precise shut-off capability in oil-free systems.



**Economizer**

The Economizer is a key efficiency-boosting component in oil-free systems, designed to enhance refrigerant cycle performance by optimizing intermediate cooling within the compressor process. By subcooling the liquid refrigerant before it enters the evaporator, the Economizer increases the mass flow through the compressor, resulting in higher cooling or heating capacity and improved overall system efficiency. This translates into reduced energy consumption, better part-load performance, and greater operational savings — making it an essential element in high-performance oil-free chillers, heat pumps, and heat recovery applications.

2026 Novelty



**DST G4ze gas sensor**

The DST G4ze gas sensor features a patented top-down design for reliable detection of any R1234ze refrigerant leaks in oil-free systems. With permanent factory calibration, it requires no field adjustments or re-zeroing throughout its 15+-year service life. This sensor ensures continuous safety monitoring, helping operators meet environmental and safety standards while maintaining the integrity of oil-free cooling and heating systems.

Explore our oil-free solutions  
oilfree.danfoss.com

The Danfoss logo is displayed in a red rounded rectangle. The word "Danfoss" is written in a white, elegant, cursive script font.

## Partner with Danfoss and gain a decisive competitive advantage with the **industry's only complete oil-free ecosystem.**

Our unprecedented portfolio of qualified components is engineered to work together, enabling you to accelerate your time-to-market with faster system design, reduce complexity, and deliver unmatched value with higher capacity and zero performance degradation. This isn't just a set of components — it's a future-proof platform designed to lower your risk and boost your customers' ROI.

**Contact our application experts today  
to start designing your next generation  
of high-efficiency, oil-free systems.**



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