ENGINEERING TOMORROW



Technical Article | Maneurop Reciprocating Compressors Article

Tried, tested, and blue: what makes **Maneurop reciprocating compressors** an industry favorite?

Instantly recognizable by their iconic blue color, Danfoss' Maneurop® reciprocating compressors have been a staple in the global cooling industry for over 50 years. And with the standard NTZ and MTZ 1-cylinder models now also qualified for use with ultra-low-GWP A2L refrigerants, they're every bit as relevant today.

By Erik Roels and Gustavo Vieira Asquino, Regional Marketing and Sales Developers, Danfoss Climate Solutions.

Delivering high levels of performance and efficiency, Maneurop reciprocating compressors are a proven, established technology for cooling – with applications in air conditioning, commercial refrigeration, and everything in between. So what about their design makes them such a favorite among OEMs and refrigeration technicians alike?

Easy to install – and fits every cooling application

One factor in their popularity is their suitability for a vast range of applications and operating temperatures. Each of the 22 Danfoss Maneurop® MTZ models can be used with multiple refrigerants, including low-GWP options, across the range's cooling capacities from 1.9 to 20.3 kW (13 HP).

The MTZ range's versatility has further increased thanks to a recent evolution to their design, reducing its minimum condensing temperature to 10°C when working with R448A, R449A, or R452A.



The lower condensing temperature makes the larger sizes even more attractive compared to semi-hermetic compressors. It enables them to perform in a wider range of working conditions, such as reduced condensing pressure.

Meanwhile, the NTZ range covers capacities from 0.8 to 6 kW (7.5 HP)—and and offers a higher coefficient of performance than any comparable hermetic, low-temperature reciprocating compressor.

And Danfoss Maneurop[®] reciprocating compressors come in sizes that fit every design, starting from just 30 cm3 up to 272 cm³. Both the NTZ and MTZ ranges have rotalock connections that don't require brazing, making them simple to install— with the option of solder adaptors in the packaging box for those who prefer it.

"The workhorse of refrigeration"

As well as their reliability, the blue Maneurop[®] compressors are popular with installers and end users worldwide for their reliability, serviceability, and ease of use.



People really like the possibility to take one kind of compressor, and use it in so many applications. It makes it so much easier to install and service. But the real difference is the reliability—a Maneurop® compressor is built like a tank; it just keeps on going. And that's why they compete so well against semi-hermetic compressors.

Engineered for efficiency, reliability, and performance

Great efficiency and reliability starts with great engineering design—and that holds true for the Danfoss Maneurop® portfolio. They're designed with:

Sculpted piston heads

To optimize performance and reduce the dead zone in the cylinder, the piston—or pistons—in a Maneurop® compressor has a uniquely designed head. It's sculpted to provide minimum clearance volume in the cylinder, enabling the piston to have a full upstroke. It's an approach more often used in racing cars, which offers the maximum possible performance for its footprint.



Uniquely designed valve plates

Inside the compressor, a specially designed suction valve plate and ring valve support more mechanical, thermal, and pressure stresses than any of our competitors' valve systems. It can withstand 205,200 opens and closes an hour and is designed with a very large intake area. This acts like the turbo in a car engine, to minimize the dynamic pressure drop of suction gas.

Internal muffler and thermal protection

Maneurop® reciprocating compressors are designed for durability. A thermal protector, consisting of a Klixon thermostat connected directly to copper windings, provides full motor protection. If there's a significant surge in current, or the compressor begins to overheat beyond the Maximum Continuous Current (MCC), the thermal protector reacts immediately to protect the motor. It provides an accurate and reliable last line of protection, only releasing the compressor when it's safe to do so.

ENGINEERING TOMORROW

Meanwhile, an internal muffler reduces the sound and vibrations produced by the compressor, making it suitable for a wider range of applications.



Made from the right materials

Smart design goes a long way in ensuring the efficiency of our reciprocating compressors. But the materials they're made from have a significant impact too.

We build most of our compressors from lightweight aluminum—from the motor support, windings, and crankcase to the pistons and connection rods. Unlike the cast iron alternatives you'll commonly find, aluminum parts ensure ideal heat distribution, enabling the compressor to run cooler. This protects its mechanics and your system from thermal stress.

Light aluminum materials also reduce the stress put on mounting springs, so compressors are likely to last longer and require less maintenance. It's also easier to install, and aluminum is suitable for use with most lubricants, keeping maintenance simple.

Blue compressors built for a greener future

Our reciprocating compressors work with a wide range of refrigerants, including the latest options.



As tightening regulations and concerns over climate change accelerate the industry's transition to ultra-low-GWP alternatives, the Maneurop® NTZ and MTZ models give OEMs and system designers a wider range of options—with the smaller sizes qualified for use with A2L refrigerants, including R454C and R455A.

With so much change and uncertainty in the industry, it's reassuring to know that one of the trusted icons of cooling technology is here to stay—and is ready to help its users face a greener, low-carbon future.

ENGINEERING TOMORROW

To find out more about Danfoss Maneurop reciprocating compressors, visit compressors.danfoss.com



Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other available servers the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or Danios reserves in Fight to differ the product of the product of the product. Interior of the product. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.