

# BITZER

## Eco-Friendly Comfort: Modern HVAC Technology for Railway Transport



The phase-down of fluorinated refrigerants is accelerating in the EU. Due to current regulations, natural refrigerants are in growing demand for mobile applications, such as heating and air conditioning in rail vehicles.

BITZER offers reciprocating and scroll compressors designed for operation with natural refrigerants, optimally tailored to the needs of railway heating and air conditioning systems.

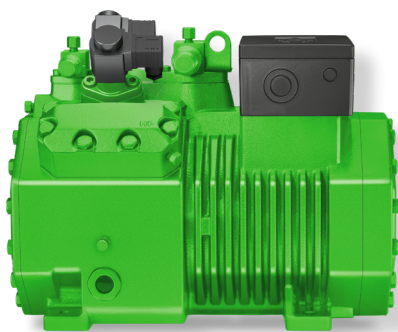
The refrigeration, air conditioning and heat pump industry supplying to Europe must already prepare for severe refrigerant restrictions on new and existing systems. Above all, the F-Gas Regulation 2024/573 requirements are decisive, combined with the expected PFAS bans under the EU REACH chemicals regulation. Natural refrigerants are gaining importance as they are

considered to be available in the long term due to their low environmental impact.

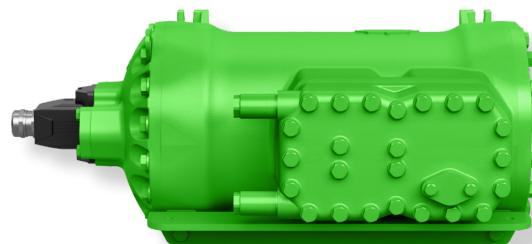
To secure investments, it is crucial to reconsider the heating and cooling systems of rail vehicles due to their long development and service lifespans. Natural refrigerant solutions should match or exceed the energy efficiency of conventional systems while maintaining or reducing equipment, operating and maintenance costs. Components must meet strict requirements, as reliability, efficiency and durability directly affect overall costs.

### Propane for Sustainable HVAC Systems

The hydrocarbon refrigerant propane (R290) is an attractive option due to its excellent thermodynamic properties. BITZER has many years of experience in the



Reciprocating compressor ECOLINE PRO



Reciprocating compressor CO<sub>2</sub>LITE

field of natural refrigerants, offering a comprehensive portfolio of suitable components. For propane, these include the ultra-compact, low-noise scroll compressor series SPEEDLITE ELV52 PRO, which is around 50 percent lighter than conventional models. The compressors feature a highly efficient suction gas-cooled permanent magnet motor and an outstanding cooling capacity to weight ratio. The wide control range ensures efficiency even under dramatically changing conditions, while a separate speed control adjusts capacity to the current cooling and heating load, ensuring high passenger comfort at all times.

In order to reduce operating costs and minimise the carbon footprint through lower energy consumption, the reciprocating compressor technology for the transport sector, the BITZER ECOLINE PRO series, has been developed with a particular focus on energy efficiency. Mechanical capacity regulators enable virtually stepless capacity control, ensuring unmatched efficiency during part load operation throughout the year.

## Lightweight and Compact CO<sub>2</sub> Systems

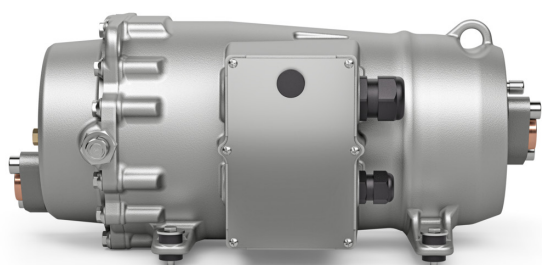
CO<sub>2</sub> (R744) represents another environmentally friendly alternative for the air conditioning of rail vehicles. In this case, it is also important that the systems are

designed to be as lightweight as possible in order to minimise the roof load and reduce power consumption during operation.

The CO<sub>2</sub>LITE reciprocating compressors from BITZER are an ideal option. With a low height of 257mm and a weight of less than 80kg, the CO<sub>2</sub>LITE meets the highest efficiency requirements even at low ambient temperatures. The reciprocating compressors have a wide capacity range and are particularly strong in complete thermal management, enabling environmentally friendly CO<sub>2</sub> systems even in the smallest of spaces. Another advantage for systems engineering: the CO<sub>2</sub>LITE can be used both horizontally and rotated 90° around its longitudinal axis, thus offering maximum flexibility.

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 75 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 2023, more than 4,300 employees generated a turnover of €1.01 billion; expenditure for research and development totalled €61 million.



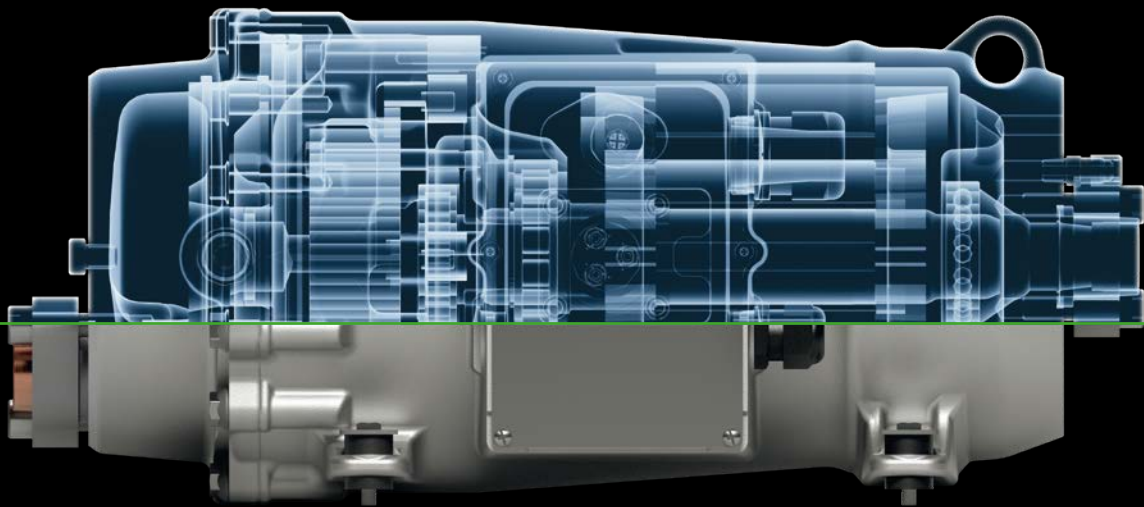
Scroll compressor SPEEDLITE ELV52 PRO

[www.bitzer.de](http://www.bitzer.de)






DAS HERZ DER FRISCHE



## COMPACT AND LIGHTWEIGHT. STRONG AND EFFICIENT.

The BITZER SPEEDLITE ELV52 scroll compressor for buses and trains is not only compact, lightweight and quiet, but also offers a wide speed range for outstanding performance and high efficiency in heating and cooling regardless of the conditions. Learn more at [bitzer.de/speedlite\\_en](http://bitzer.de/speedlite_en)

-  AIR  
CONDITIONING
-  HEAT  
PUMPS
-  BUS
-  RAILWAY
-  PROPANE