



THE ELECTRIC AIR CONDITIONING COMPRESSOR



IN MODERN
THERMAL
MANAGEMENT
SYSTEMS, THE
COMPRESSOR
PLAYS A
CRUCIAL ROLE

THE ELECTRIC A/C COMPRESSOR

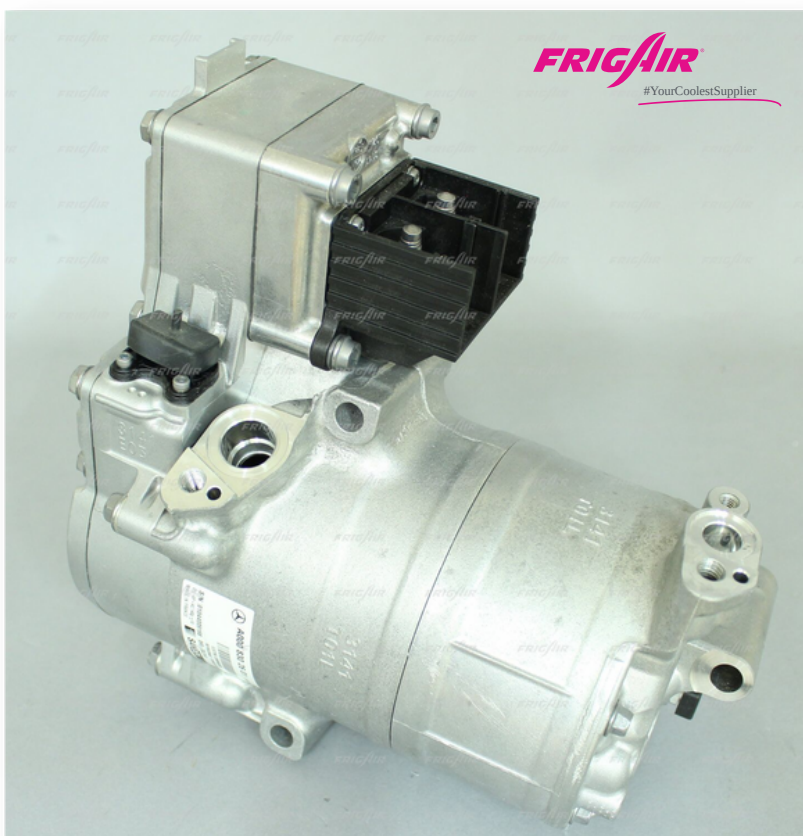
The high-voltage A/C compressor (known as the electric A/C compressor) is installed in vehicles with Mild Hybrid, Full Hybrid, and EV technology, and it operates independently of the internal combustion engine. In hybrid and electric vehicles equipped with a heat pump, the HVAC system (Heating, Ventilation, and Air Conditioning) acts as the vehicle's thermal management system ensuring not only climate comfort inside the cabin but also managing all the main functions of the car, such as battery efficiency and lifespan, consequently affecting the overall vehicle range.

Now in the **FrigAir** range

THE BENEFITS OF HIGH-VOLTAGE COMPRESSORS

:Electric compressors with high voltage offer some advantages compared to traditional compressors:

- **Stable compression**
- **Higher efficiency:** compared to a traditional compressor, it requires less energy for operation, reducing energy consumption and prolonging the vehicle's battery life. The operation and speed control of the high-voltage compressor are carried out by controlling the current, regulated by the PIM (Power Inverter Module)
- No need for regulation valves or speed sensors.
- The high-voltage compressor can operate even when the electric motor of the vehicle is off, and the vehicle is not in motion. In addition to their excellent air conditioning capabilities, these compressors are designed to be used in heat pumps and heat generation as well.
- **Quieter and capable of reaching higher speeds.** Thanks to fewer components, the mechanical mechanisms are simpler.
- **Reduced and compact size** The lack of a direct connection to the internal combustion engine facilitates its placement in the vehicle's design.



Many high-voltage compressor models have two connectors in the unit. The larger connector is used for the high-voltage connection to the vehicle's battery. For safety reasons, both the connector and the wiring to the battery are brightly colored in orange to indicate high voltage.

The second, smaller connector is used for communication between the compressor and the HVAC system control unit. The control unit sends input signals to the PIM module, which translates them and directly operates the compressor through voltage signals that control the level of electric current sent to the electric motor. The level of electric current determines the compressor's output torque, while the signal frequency controls the motor's speed

Specialized expertise is required for interventions and maintenance of high-power compressors.

We want to emphasize that additional training is necessary for repairing hybrid and electric vehicles. To be able to carry out maintenance and repair of complex Thermal Management systems in hybrid vehicles, it is essential to stay constantly updated and attend dedicated courses.