

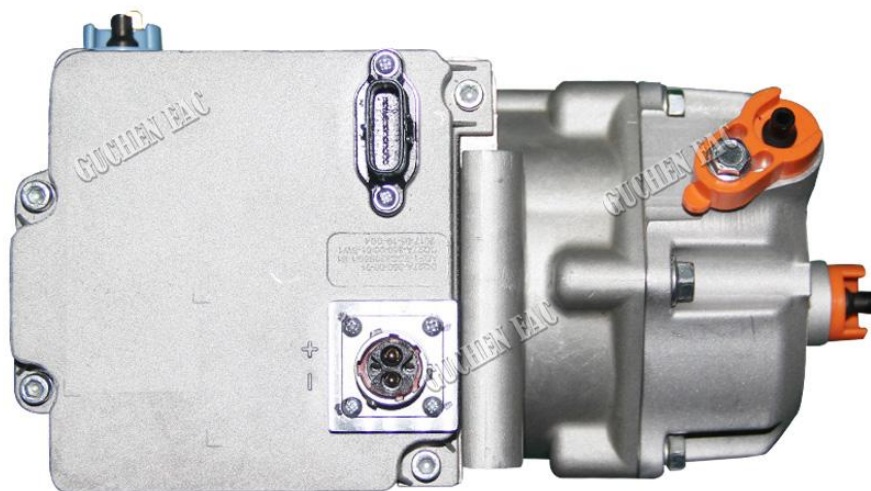
## Heat Pump may Become the Best AC Solution for BEVs

Electrification changes car air conditioning.

In the field of automotive air conditioning, more pronounced changes are taking place than in residential and building air conditioning. Under the tide of decarbonization, it is expected to usher in the field of pure electric vehicles (EVs) with rapidly expanding demand. The technology of automotive air conditioners is also being updated, and energy-saving performance is directly related to the cruising distance. Tesla in the United States has begun to actively develop air conditioners, and Japan's Denso will also speed up its actions.

A car's air conditioner uses the same principle as a home air conditioner to produce cold air, but the heating uses the waste heat from the engine. However, pure electric vehicles do not have an engine. Although heat can be generated by a simple electric heater, the power consumption is huge, and the battery power used for driving is consumed. Therefore, the same heat pump technology as indoor air conditioning heating has received attention.

This technology uses [heat pump electric compressors](#), heat exchangers and refrigerants to capture the heat present in the air as a heat source for heating. Some data show that compared with electric heaters, the energy-saving efficiency of heat pump car heating is as high as about 3 times.

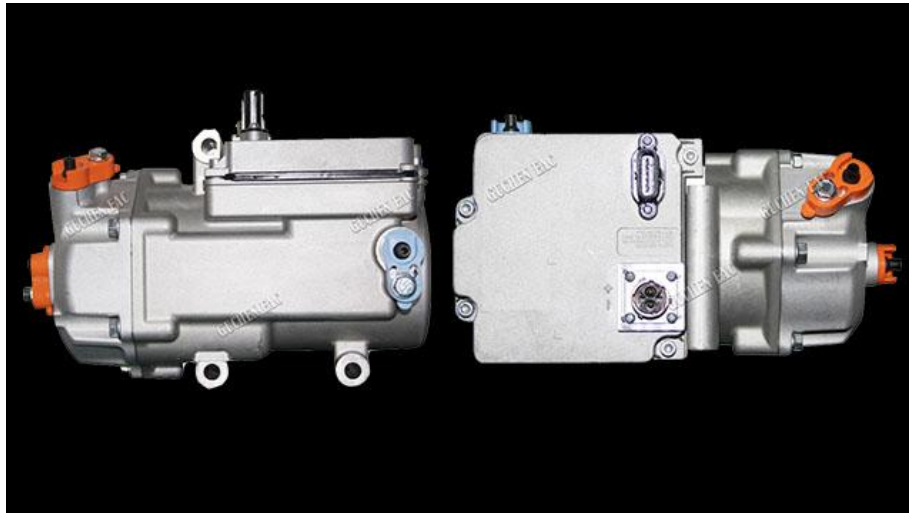


Tesla has used heat pump air conditioners for the SUV "Model Y" and the sedan "Model 3". Chief Executive Officer (CEO) Elon Musk said in the fall of 2020, "or will start the home air conditioner business in 2021. I think it can make air conditioners that are quieter, more efficient, and more energy-efficient." Like its foray into the home battery business, Tesla is exploring heat pump technology laterally. This technology can play an important role in extending the battery life of

pure electric vehicles.

In addition, automotive air-conditioning manufacturers Denso will also actively develop heat pump type. Denso delivered a heat pump type to Toyota's plug-in hybrid (PHV) "Prius PHV" in 2017, and it will also be used in Toyota's first mass-produced pure electric vehicle "bZ4X", which is scheduled to go on sale in 2022.

The system of SANDEN HOLDINGS was also adopted by Chinese pure electric vehicle companies in 2018. Toyota Auto Loom delivered the [heat pump compressors](#) to Tesla.



In addition, overseas competitors will also launch actions. An active player is HANONSYSTEMS, Korea's largest auto air conditioner manufacturer. In 2021, it will expand sales of pure electric vehicles from Hyundai Motor, and announce the construction of a new plant in South Korea in 2021 to supply about 300,000 pure electric vehicles. German companies Bosch and Mahle and France's Valeo have also launched new products one after another.

However, the structure of the heat pump air conditioner is complicated and the cost will also increase. In China's cheap pure electric vehicles, some are only equipped with heating systems with electric heaters. Some component manufacturers believe that "the allocation rate of pure electric vehicles may only be half." In this case, how to improve the attractiveness of the heat pump system has also become a problem.



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