

Automotive E-Compressor Market Assessment, By Type [Scroll, Rotary, Centrifugal, Reciprocating, Axial], By Propulsion [Battery Electric Vehicle, Fuel Cell Electric Vehicle, Hybrid Electric Vehicles, Plug-In Hybrid Electric Vehicle], By Vehicle Type [Passenger Cars, Light Commercial Vehicles, Medium and Heavy Commercial Vehicles], By Sales Channel [Original Equipment Manufacturer, Aftermarket], By Region, Opportunities and Forecast, 2018-2032F

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Report description:

Global automotive e-compressor market is projected to witness a CAGR of 23.66% during the forecast period 2025-2032, growing from USD 2.67 billion in 2024 to USD 14.60 billion in 2032.

A significant catalyst for this growth is the increasing adoption of electric vehicles, where consumers increasingly prefer vehicles that require efficient climate control systems. E-compressors play a very important role in providing efficiency and work independently of the engine to enhance overall energy management. Furthermore, governments of different countries are granting incentives and framing different emission regulations, driving the growth of EVs, which further forces automakers to shift from traditional engine-driven compressors to electric-powered compressors. Moreover, continuous technological improvements in e-compressor design, including variable speed capabilities and enhanced efficiency, make these systems more attractive to manufacturers and consumers. These innovations allow for better integration into modern vehicles, especially hybrids and EVs, where precise temperature control is crucial for both battery management and passenger comfort.

Moreover, economic growth and rising disposable incomes increase vehicle ownership rates, particularly in developing regions, which further boosts demand for e-compressors in both passenger and commercial vehicles. With increasing consumer demands on vehicle comfort and luxury, the demand for efficient air conditioning systems is on the rise as well, and e-compressors become

the obvious choice as they outperform other conventional compressors and have a lesser impact on the environment. All these factors create a strong foundation for the growth of the automotive e-compressor market as it continues to shift towards sustainable and efficient vehicle technologies.

For instance, in May 2024, Sanden Manufacturing Europe S.A.S. (SME), part of Sanden Corporation, announced a new production line for next-generation electric compressors across the European area to address the accelerated electrification of the automotive industry. The next-generation compressors manufactured on the state-of-the-art production line are based on a platform design and will be able to meet a wide range of needs, from high to low voltage, from large capacity to compact size. Electrification of Vehicles is Propelling the Global Automotive E-Compressor Market

The trend towards electrification is restructuring the market for automotive e-compressors. Growth is mainly fueled by the surge of electric vehicles, with an upward trend of sales, up to 14 million units across the globe in 2023, marking a 35% growth. Unlike traditional belt-driven compressors, E-compressors operate independently using electric motors, making them ideal for EVs requiring efficient thermal management systems without relying on engine power. Government initiatives also contribute to this growth. For example, China's extension of EV subsidies through 2030 and U.S. investments in EV charging infrastructure drive the electric mobility transition. These policies encourage consumers to buy EVs and create demand for automotive components such as e-compressors. Major automobile manufacturers, along with consumers, are gaining interest in eco-friendly transportation options.

For instance, in July 2024, ZHENGZHOU GUCHEN INDUSTRY CO., LTD. launched GC-33CC Electric Air Conditioning Compressor for Tesla, Inc. Model S and Model X electric vehicles. It will ensure that the customers enjoy the highest levels of comfort and efficiency.

Technological Advancements Fuel the Global Automotive E-Compressor Market Growth

Rapid advancements in compressor technology are reshaping the global automotive e-compressor market, reflecting a broader shift towards more efficient and sustainable vehicle technologies. One of the main technological developments that are improving the e-compressor market is variable speed compressors. These systems can better control heating and cooling requirements, hence improving energy efficiency and enhancing the range of the battery. Advancements in power electronics integration also enhance energy management within vehicles, hence optimizing the performance of e-compressors while minimizing power consumption. This is especially vital in any high-demand scenarios, such as fast-charging sessions, during which effective thermal management is critical to preventing battery degradation. Additionally, the implementation of smart technologies in e-compressors will enhance their functionality. Predictive maintenance capabilities and real-time diagnostics provide reliability and make it user-friendly. The latest advances in materials and manufacturing techniques include 3D printing and augmented reality in the design process, which further contributes to the efficiency and performance of e-compressors. Hence, manufacturers and consumers are increasingly drawn to such a system.

For instance, in November 2024, Honda Motor Co., Ltd. unveiled the world's first V3 motorcycle engine with an electrical compressor at EICMA 2024. It features the world's first electrical compressor for motorcycles, which can control compression of the air intake irrespective of engine rpm, meaning that high-response torque can be delivered even from lower rpm. In addition, the electrical compressor allows a high degree of freedom of layout in the limited space available in a motorcycle and efficient centralization of mass.

Light Commercial Vehicles to Dominate the Global Automotive E-Compressor Market Share

Light commercial vehicles dominate the global automotive e-compressor market due to several key factors, including the electrification of vehicles and technological advancements in vehicle technology. LCVs are imperative for the needs of urban logistics and last-mile delivery services. The increasing adoption of electric vehicles, especially in the LCV segment, has been one of the prime drivers of this trend. E-compressors play a significant role in controlling climate control systems in electric and hybrid LCVs and can be operated efficiently even when the engine is turned off. This would enhance fuel efficiency and maintain passenger comfort, driving the automotive e-compressor demand for light commercial vehicles. Therefore, manufacturers are opting for e-compressors to meet stringent emission regulations and customer expectations for sustainability. Moreover, due to significant investment in product development and innovation, the LCV segment is recognized as the fastest-growing category within the automotive e-compressor market. Companies are focusing on launching technologically advanced e-compressors designed to improve product quality and lifespan while catering to the rising consumer demand for

efficient heating, ventilation, and air conditioning (HVAC) systems. For instance, in July 2024, Robert Bosch GmbH acquired the LCV HVAC business from Johnson Controls International plc and Hitachi, Ltd.

Asia-Pacific to Register the Largest Global Automotive E-Compressor Market Size

Asia-Pacific is likely to hold the largest market size for automotive e-compressors, with several key factors including a significant rise in demand for electric passenger and commercial vehicles, rising awareness concerning sustainability, and stringent government regulations concerning net zero carbon emissions. This growth is largely driven by the rapid adoption of electric vehicles across Asia-Pacific countries, particularly China and India, which has emerged as a leader in EV production and sales. The government has taken several initiatives to promote electric mobility, such as providing subsidies and other incentives. For example, China set a target of more than 20% of vehicle sales to be electric by 2025, which it achieved ahead of schedule in 2022. Other countries in the region, such as Japan and South Korea, are also stepping up their efforts to transition towards electric vehicles, with ambitious plans to increase their production and sales of EVs in the coming years, propelling the global automotive e-compressor market demand. The increasing consumer awareness about environmental sustainability and the demand for fuel-efficient solutions further boosts the requirement for e-compressors in LCVs and passenger vehicles. Moreover, high investments by the leading automotive manufacturers in research and development in the region have improved e-compressor technologies.

For instance, in April 2024, Tata Motors Ltd., as part of their One Tata approach to manufacturing electric vehicles, announced that Pune-based Tata AutoComp Systems Limited had played a pivotal role in the localization of components for Tata Motors. Tata AutoComp Systems Limited produces battery packs and BMS, battery thermal management systems, and electric compressors. The company has achieved over 80% localization and has even started a local assembly of e-compressors.

Future Market Scenario (2025-2032F)

Innovations like variable speed capabilities and improved thermal management systems enhance e-compressor performance. Ongoing R&D efforts focus on reducing production costs and improving reliability.

Increased production of passenger and commercial vehicles drives demand for automotive e-compressors, particularly in emerging markets.

□ Policies promoting EV adoption, such as subsidies and investments in charging infrastructure, are expected to further boost the demand for automotive e-compressors.

Key Players Landscape and Outlook

The global automotive e-compressor market is very competitive, with hundreds of key players contributing significantly to market growth and innovation, as leading companies specialize in developing advanced thermal management solutions and energy-efficient e-compressors for electric vehicles. They also aim to create eco-friendly or healthy products while meeting worldwide sustainability trends, leading to an increased chance of enhancing brand reputation and attracting environmentally conscious customers. The competitive landscape hosts several key players who have been actively innovating and cooperating to strengthen their position in the market and expand their product offerings, with the view to stay ahead in this fast-changing industry.

For instance, in April 2023, ZF Friedrichshafen AG announced the launch of its high-speed electric air compressor, which was developed in partnership with Liebherr-International Deutschland GmbH for fuel cells. This compressor is a modular and scalable air compressor for fuel-cell-powered commercial vehicles.

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