Low energy consumption and high comfort: the electric drive in the new Audi A2 e-tron

Ingolstadt, Germany, November 3, 2026 — The new Audi A2 e-tron* is the most efficient Audi ever. Numerous development measures contribute to this. Alongside aerodynamics and battery technology, the further developed drive technology plays a decisive role. Improvements to the power electronics, the electric motor, and the transmission complement one another in the new electric compact model from Audi. The result: Customers benefit from low consumption, long range, and pleasant acoustics.

The key facts

- The A2 e-tron* is designed with a focus on low energy consumption, making it the most efficient Audi ever
- With 140 kW of power and the optional efficiency package, the electric compact model consumes 12.8 kWh/100 km according to the WLTP cycle
- Silicon carbide semiconductors in the power electronics minimize switching losses
- Improved control reduces the switching frequency, especially in the partial-load range
- Thin rotor laminations reduce iron losses
- Stator winding in a delta configuration enables high torque and low consumption
- A long gear ratio of 10.2:1 keeps motor speeds low
- Transmission oil with very low viscosity reduces churning losses
- Targeted noise reduction in the drive system enhances acoustic comfort

Upgraded APP350 electric drive

At the rear of the Audi A2 e-tron*, a permanent-magnet synchronous motor serves as the drive. It is positioned parallel to the axle and operates at a 400-volt level. The APP350 from the Volkswagen Group delivers up to 350 Nm of torque and was specifically optimized for the Modular Electric Drive Matrix (MEB) to deliver greater efficiency, longer range, and more driving comfort at the same time. The improvements primarily affect the power electronics, the electric motor, and the transmission.

The pulse inverter converts the direct current (DC) from the high-voltage battery into the alternating current (AC) required by the electric motor. Based on relevant sensor data, it controls the energy flow precisely and as needed. The power semiconductors used have a major influence on the drive's efficiency.

The equipment, data and prices specified in this document refer to the model range offered in Germany. Subject to change without notice; errors and omissions excepted.

**The combined fuel and electric power consumption and emissions values of all models named and available on the German market are listed at the end of this text.*

Instead of the silicon-based bipolar transistors that have been the standard until now, **metal-oxide-semiconductor field-effect transistors (MOSFETs)** based on **silicon carbide (SiC)** are used in the **newly developed pulse inverter**. The special physical properties of silicon carbide reduce switching losses and enable efficiencies of more than 97 percent.

A new software function takes advantage of the higher possible switching speed of the SiC MOSFETs and reduces energy use further. Using an **adaptive operating strategy**, the switching frequency can be adjusted to the respective operating point. A lower switching frequency means fewer losses. The new method makes particular use of this efficiency potential in the typical operating ranges of the electric drive — in city traffic and on rural roads, at medium speed and load. Thanks to improved energy utilization, the power electronics can also supply the drive of the Audi A2 e-tron* with full power at low states of charge.

For greater acoustic comfort in the interior, the pulse inverter has another function. It selectively superimposes high-frequency harmonic components on the motor current. Disruptive noises are thus compensated for, depending on the operating point.

The electric motor

The **permanent-magnet synchronous motor APP350** in the Audi A2 e-tron* is a consistent further development within the Modular Electric Drive Matrix (MEB). It improves efficiency without compromising torque or power delivery. Design measures on the rotor and stator affect the lamination thickness, the arrangement of the rotor segments, and the wiring of the stator windings.

Compared with the MEB predecessor drive APP310, the **rotor thickness was reduced by more than 30 percent**. This measure reduces iron losses, which arise when the material is repeatedly remagnetized by magnetic fields over time.

To improve drive acoustics, the **rotor segments** of the electric motor are no longer arranged linearly but **in a staggered pattern**. As a result, the excitation does not geometrically replicate the rotor's first torsional mode: first-order vibrations are avoided, and dominant tonal components are almost eliminated, particularly when pulling away from a standstill. Customers benefit from a quieter interior.

Switching the stator winding from a star to a delta configuration, along with reducing the number of parallel branches, increases the efficiency of the electric motor. This applies particularly to operating ranges that matter most to customers, such as everyday driving under partial load in city traffic or on rural roads.

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Transmission

The compact, lightweight transmission in the Audi A2 e-tron* also contributes to higher efficiency through technical refinements. Depending on the performance level, the APP350 in the Audi A2 uses two gear ratios: i=10.21 at 125 kW and 140 kW, and i=11.53 at 170 kW. The gear ratio selected for each motor variant keeps motor speeds in the most efficient ranges of the characteristic map, further reducing consumption in everyday driving.

The gear teeth are also finished by fine machining, which produces particularly smooth tooth flanks. This reduces friction losses in the transmission and further increases the drive's efficiency.

This fine machining also allows the use of a specially developed, low-friction transmission oil with very low viscosity. Combined with optimized oil routing in the transmission, this significantly reduces churning losses in the gear set.

Frequently asked questions

Which drive does the most efficient Audi model use?

The Audi A2 e-tron 140 kW* is equipped with a permanent-magnet synchronous motor installed parallel to the axle, delivering up to 350 Nm of torque. With the optional efficiency package and an axle ratio of i=10.2, the model achieves combined consumption of just 12.8 kWh/100 km according to the WLTP cycle.

What sets the APP350 that powers the A2 e-tron* apart?

The electric drive unit was specifically optimized for the MEB to deliver greater efficiency, longer range, and more driving comfort at the same time. The Audi A2 e-tron* uses it in three performance levels.

What influence do the power electronics and their software functions have?

The pulse inverter in the Audi A2 e-tron* uses silicon carbide semiconductors and thereby achieves efficiencies of more than 97 percent. New software functions enable an adaptive operating strategy. The switching frequency—and with it the power loss—can be significantly reduced depending on the drive's operating point.

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About Audi

Audi combines premium mobility with technological progress and pioneering design. For more than five decades, “Vorsprung durch Technik” has embodied the technological aspirations of Audi.

Audi offers a broad portfolio of premium vehicles for different customer needs and regional requirements. The Audi Group operates in more than 100 markets, produces at 21 production sites in twelve countries, and employs more than 88,000 people worldwide. The brand’s history dates back to 1909. Since 2026, Audi has also been competing in Formula 1 with its own factory team.

In addition to the Audi brand, the Audi Group includes the sports car manufacturer Lamborghini, the luxury brand Bentley, and the motorcycle manufacturer Ducati.

Find out more about the Audi Group here.

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Combined fuel and electric power consumption and emissions values of the models named above:

Audi A2 e-tron
Combined electric power consumption in kWh/100 km: 15.7–12.8;
combined CO_2 emissions in g/km: 0; CO_2 class: A

Audi A2 e-tron 140 kW
Combined electric power consumption in kWh/100 km: 15.6–12.8;
combined CO_2 emissions in g/km: 0; CO_2 class: A