V4Smart + Porsche 911 Carrera GTS and Turbo S Models

with T-Hybrid Technology

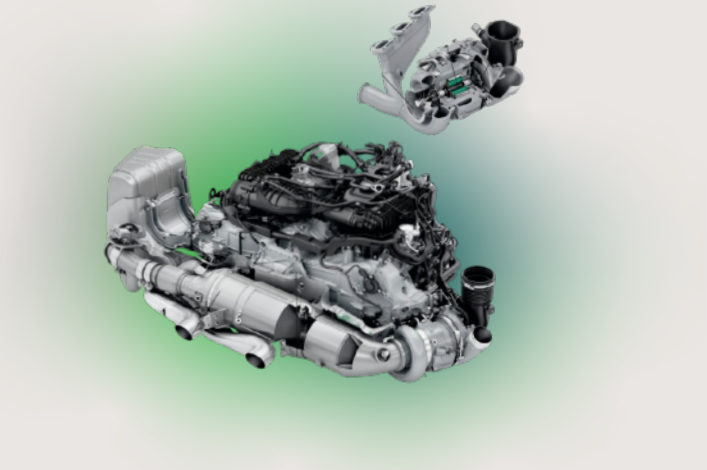
V4SMART
German battery expertise since 1887

V4Smart (formerly V4Drive), now majority-owned by Porsche, specializes in high-power lithium-ion cylindrical cells made in Germany, backed by more than 135 years of battery know-how. With a focus on ultra-fast charging, high-power discharging, and advanced thermal management, V4Smart cells are designed for demanding automotive applications and beyond.

Within this context, V4Smart was chosen to provide energy solutions for the new 911 Carrera GTS and 911 Turbo S models, playing a central role in this innovation case that not only allows for another significant increase in power and improved acceleration but is also readying the vehicle for future emission standards.

The new 911 T-Hybrid Powertrain – *a Technical Innovation*

For the new 911 Carrera GTS and Turbo S models, Porsche developed a new powertrain with T-Hybrid technology. The lightweight and powerful T-Hybrid system has newly developed electric exhaust gas turbochargers. Two are used in the new 911 Turbo S, an one is used in the 911 GTS. An integrated electric motor, placed between the compressor and turbine wheel, instantaneously brings the turbocharger up to speed. This immediately builds up boost pressure. In addition to the significant increase in boost-performance, another key advantage of eTurbos is recuperation - i.e. energy recovery - from exhaust energy. It recovers up to 14 kW (19 PS) of electric power per eTurbo in the case of the 911 Turbo S. The powertrain also includes a permanently excited synchronous motor incorporated into the new, reinforced, eight-speed dual-clutch transmission (PDK).



This assists the boxer engine right from idling speed with drive torque of up to 188 Nm and provides power of up to 60 kW in the 911 Turbo S models. The 911's hybridization requires high pulse power, rapid energy intake, and tight thermal control in a small, lightweight package. V4Smart's V21700 UHP-26 booster cells deliver precisely that profile – supporting instant torque fill, boost-spool assistance, and frequent charge/discharge transients without external charging.

V4Smart – Leader in High Power Cell Technology

V4Smart V21700 UHP-26 booster cells set new standards in ultra-high power lithium-ion technology. Their exceptional ability to deliver pulse power up to 400 W for 10 seconds and continuous currents of 100 A makes them ideal for demanding applications in the new Porsche 911 Carrera GTS and Turbo S models with T-Hybrid technology but also fuel cell trucks, or other hybridized systems in aerospace and security applications. Thanks to their low internal resistance, less heat is generated even at extreme loads, resulting in a uniform temperature distribution and enabling longer operating time. Alongside an impressive fast-charge capability of under 6 minutes to 80% SOC, the Booster cells demonstrate outstanding cycle stability and long lifespan — ensuring reliable performance throughout the entire life.

Results and Benefit

Instant Power Delivery: V4Smart cells enable immediate response of the T-Hybrid system combined with the PDK e-motor, delivering peak power for maximum driving dynamics.

Rapid Energy Recovery: The battery recharges extremely quickly during driving through energy recuperation and the electric turbocharger generator. This ensures that sufficient battery power is always available for peak performance.

Thermal Stability: Uniform temperature distribution and low heat generation ensure consistent performance even under extreme load cycles.

Compact Design: The lightweight architecture integrates seamlessly into the 911 DNA, supporting optimal weight distribution.

V4Smart V21700 UHP-26 booster cells

Key Features

- > 8,400 W/L Best-in-class power density
- Ideal heat dissipation and distribution in the cell
- > 2,500 cycles at 100% Depth of discharge (DOD) with a capacity of over 80% State of health (SOH)
- < 6 minutes fast-charging capability up to 80% State of Charge (SOC)
- IATF16949 Automotive standard certified production in series

Conclusion

The 911 T-Hybrid platform demonstrates how targeted hybridization – prioritizing power density, energy recovery, and thermal control over large stored energy – can lift a legacy performance icon into a new era without compromising its character. V4Smart booster cells align with this philosophy, delivering the short-burst power and rapid charge acceptance the system needs to make the eTurbo and PDK e-motor shine.

From the first-ever hybrid 911 Carrera GTS to the most powerful 911 to date – the Turbo S – the architecture scales effectively, validating the high-power booster-cell approach as a credible path to faster, more responsive and repeatable performance – without the charging and mass overhead of a plug-in hybrid.

Consumption data
911 Carrera GTS (WLTP)*: Fuel consumption combined (model range): 10.9 – 10.4 l/100 km, CO_2-emissions combined (model range): 248 – 236 g/km, 911 Carrera 4 GTS (WLTP)*: Fuel consumption combined (model range): 11.0 – 10.4 l/100 km, CO_2-emissions combined (model range): 249 – 236 g/km

911 Turbo S (WLTP)*: Fuel consumption combined (model range): 11.7 – 11.5 l/100 km (preliminary value), CO_2-emissions combined (model range): 266 – 262 g/km (preliminary value), 911 Turbo S Cabriolet (WLTP)*: Fuel consumption combined (model range): 11.8 – 11.6 l/100 km (preliminary value), CO_2-emissions combined (model range): 267 – 265 g/km (preliminary value)

* If the values are given as ranges, these do not relate to a single, individual vehicle and do not constitute part of the offer. They are intended solely as a means of comparing different vehicle models and refer to the product portfolio that is available on the German market. Extra features and accessories (attachments, tyre formats etc.) can change relevant vehicle parameters such as weight, rolling resistance and aerodynamics and, in addition to weather and traffic conditions, as well as individual handling, can affect the fuel consumption, energy consumption, CO_2 emissions, range and performance values of a car.

Learn more about V4Smart cell technology and contact us at www.v4smart.com