



PORSCHE



# The new Porsche Panamera Turbo S E-Hybrid

Press Kit

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## Highlights

# **The Turbo S E-Hybrid is the most powerful model in the Panamera line**

## **1. The flagship of the model line.**

The Turbo S E-Hybrid is the first model with a plug-in hybrid drive to be chosen as the flagship model for the line.

## **2. Accelerates like a 911.**

The new plug-in hybrid drive delivers torque of 850 Nm, taking the Gran Turismo to 100 km/h in 3.4 seconds (Executive: 3.5 seconds).

## **3. Inspired by the 918 Spyder.**

The boost strategy was adapted from the 918 Spyder; the electric drive is not only energy-efficient, but also provides additional thrust.

## **4. Sustainable use of energy.**

Consumption in the New European Driving Cycle (NEDC) for the Panamera Turbo S E-Hybrid of 2.9 l/100 km for fuel and 16.2 kWh/100 km for electric energy.

## **5. Emission-free local driving.**

With an electric range of up to 50 kilometres (based on the NEDC), the Panamera Turbo S E-Hybrid can drive a respectable distance on electrical power alone.

## **6. Extended range of equipment.**

The top model features a significantly extended range of standard equipment, including air suspension, ceramic brakes, 21-inch wheels, an active chassis and a Bose® sound system.

## **7. All-wheel drive as standard.**

The new Panamera Turbo S E-Hybrid is delivered with active all-wheel drive (Porsche Traction Management) as standard.

## **8. Two wheelbases.**

An Executive model of the Panamera Turbo S E-Hybrid with long wheelbase is available as standard in China and as an option in the remaining markets.

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## Summary

# **New Panamera top model with the drive concept of the 918 Spyder**

With an unprecedented combination of performance, comfort and efficiency, the new 500 kW (680 hp) Panamera Turbo S E-Hybrid highlights the importance of electromobility at Porsche. For the first time, the Stuttgart-based sports car manufacturer has made a plug-in hybrid the top model in a model line. The Panamera Turbo S E-Hybrid – capable of top speeds of up to 310 km/h – is powered by an electric motor (100 kW/136 hp) and a V8 turbo petrol engine (404 kW/550 hp). The performance-oriented boost strategy of this engine combination was first designed for the 918 Spyder, a Porsche super sports car. The Gran Turismo model has an electric range of up to 50 kilometres for emission-free local driving.

## **Boost strategy designed for maximum performance and high energy efficiency**

A key characteristic of the Panamera Turbo S E-Hybrid is its superb power delivery across engine speed ranges. At just above idle speed (from 1,400 rpm), the car has 850 Nm of torque at its disposal; this value remains constant up to 5,500 rpm. The eight-speed Porsche Doppelkupplung (PDK) transmission transfers power to the all-wheel Porsche Traction Management (PTM) system. The electric motor and V8 engine take the Porsche to 100 km/h in 3.4 seconds, or 3.5 seconds in the Executive model with extended wheelbase. The boost strategy was developed directly from the system used in the 918 Spyder super sports car. The electric drive not only delivers exceptional energy efficiency, but also additional thrust – creating an additional electric turbo that enables Porsche to rightfully position the Panamera sports car in the same class as its large touring counterparts.

## **Electric range of up to 50 kilometres for emission-free local driving**

This exceptional performance comes coupled with outstanding efficiency. Average consumption in the New European Driving Cycle (NEDC) is 2.9 l/100 km; electricity consumption is 16.2 kWh/100 km. The top model in the Panamera line can travel up to 50 kilometres on electricity alone – an electric range that will allow many drivers of the Panamera Turbo S E-Hybrid

to complete their daily, local commute without generating any emissions at all. In Germany, for example, investigations by the Federal Ministry of Transport and Digital Infrastructure have established that 80 per cent of all car drivers in the Panamera's home country cover less than 50 kilometres per day.

### **A 7.2-kW on-board charger charges the battery in 2.4 hours at 230 V**

The electric motor in the hybrid model is supplied with energy via a liquid-cooled lithium-ion battery with an energy capacity of 14.1 kWh. The high-voltage battery integrated in the rear is fully charged in less than six hours at 10 A via a 230-V connection. If the Panamera uses the optional 7.2-kW on-board charger and a 230-V, 32-A connection instead of the standard 3.6-kW charger, the battery is fully charged in just 2.4 hours. The charging process can also be started using a timer via Porsche Communication Management (PCM) or the Porsche Connect app (for smartphones and Apple® Watch). Moreover, the Panamera Turbo S E-Hybrid is fitted with auxiliary air conditioning as standard to cool or heat the passenger compartment even during charging using energy from the power grid.

### **Three-way combination of sports car performance, comfort on long trips and efficiency**

The Porsche Panamera Turbo S E-Hybrid is the only vehicle in its class to combine the option of pure electric driving with the performance of a true sports car and the comfort of a touring car. As the second plug-in hybrid model in the model line – following in the tracks of its predecessor, the Panamera 4 E-Hybrid (340 kW/462 hp) – the Panamera Turbo S E-Hybrid highlights the importance of electromobility at Porsche.

### **Porsche Dynamic Chassis Control Sport, air suspension and 21-inch wheels as standard**

The extended standard equipment of the Panamera Turbo S E-Hybrid includes auxiliary air conditioning, Porsche Dynamic Chassis Control Sport (PDCC Sport) including Porsche Torque Vectoring Plus (PTV Plus), Porsche Ceramic Composite Brake (PCCB), Power Steering Plus and 21-inch alloy wheels in the 911 Turbo Design. The basic package also includes adaptive aerodynamic elements and three-chamber air suspension system, including Porsche Active Suspension Management (PASM). Furthermore, the Executive version is equipped with rear axle steering as standard.

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Plug-in technology and all-wheel drive

## **Next level in hybrid performance**

Following in the tracks of the Panamera 4 E-Hybrid, which is powered by a V6 biturbo engine and an electric motor, Porsche is once again showcasing the huge performance potential of hybrid technology in the new Panamera Turbo S E-Hybrid. In this top model in the line, Porsche combines a 100 kW (136 hp) electric motor with a 404 kW (550 hp) V8 biturbo engine. With both engines working in tandem, the car has a system power of 500 kW (680 hp) and 850 Nm of system torque at its disposal. The boost strategy deployed in the drive was taken from the 918 Spyder: The electric drive not only delivers exceptional energy efficiency, but also additional thrust – creating an additional electric turbo that enables Porsche to rightfully position the Panamera sports car in the same class as its large touring counterparts.

### **Electric clutch actuator and rapid eight-speed PDK**

The electric motor and the petrol engine are connected via a decoupler in the Porsche hybrid module. This electromechanically actuated Electric Clutch Actuator (ECA) guarantees fast response times and exceptional comfort. The fast-shifting, eight-speed Porsche Doppelkupplung (PDK) is used to transmit power to the standard active all-wheel drive system Porsche Traction Management (PTM). The plug-in hybrid drive takes the new Panamera top model to 100 km/h in 3.4 seconds (Panamera Turbo S E-Hybrid Executive: 3.5 seconds); the Gran Turismo has a top speed of 310 km/h.

### **Liquid-cooled lithium-ion battery**

The electric motor is supplied with power via a liquid-cooled lithium-ion battery with an energy capacity of 14.1 kWh. The high-voltage battery integrated in the rear is fully charged within six hours at 10 A via a 230 V connection. If the Panamera uses the optional 7.2-kW on-board charger and a 230-V, 32-A connection instead of the standard 3.6-kW charger, the battery is fully charged in just 2.4 hours. The charging process can also be started using a timer via Porsche Communication Management or the Porsche Connect app (for smartphones and

Apple® Watch). Moreover, the Panamera Turbo S E-Hybrid is fitted with auxiliary air conditioning to cool or heat the passenger compartment even during charging using energy from the power grid.

### **Start with “E-Power” and A+ energy efficiency rating**

The Panamera Turbo S E-Hybrid starts in the purely electric “E-Power” mode as standard. The four-door sports car drives up to 50 kilometres locally with zero emissions. When a specific pressure point is passed in the accelerator pedal, or when the battery charge level drops below a minimum value, the Panamera switches to “Hybrid Auto” mode, at which point the power from both engines is available. Consumption in the New European Driving Cycle (NEDC) for plug-in hybrid models amounts to 2.9 l/100 km for super-grade petrol (66 g/km of CO<sub>2</sub>) and 16.2 kWh/100 km for electric power. The fact that the Porsche Panamera Turbo S E-Hybrid has been awarded Germany’s top energy efficiency rating of A+ proves how efficiently the car converts energy into motion.

### **“Hybrid Auto” mode uses topology and navigation to save energy**

The Sport Chrono Package, including the mode switch integrated into the steering wheel, forms part of the standard equipment on the Panamera Turbo S E-Hybrid. The mode switch and the Porsche Communication Management system are used to select the various driving modes. These modes include the familiar “Sport” and “Sport Plus” modes from the other Panamera models equipped with the Sport Chrono Package. The hybrid-specific modes are “E-Power”, “Hybrid Auto”, “E-Hold” and “E-Charge”.

**E-Power** In “E-Power” mode, the Panamera Turbo S E-Hybrid drives up to 50 kilometres on electricity alone for emissions-free local journeys.

**Hybrid Auto** The “Hybrid Auto” mode is a completely new development. When this mode is selected, the Panamera changes and combines the drive sources automatically for ultimate efficiency.

- E-Hold** The “E-Hold” mode allows drivers to consciously conserve the current state of charge to enable them to switch to electric and therefore zero-emissions mode in an environmental zone at their destination, for example.
- E-Charge** In “E-Charge” mode, the battery is charged by the eight-cylinder engine; to achieve this, the petrol engine generates a higher level of power than is actually needed just for driving.
- Sport and Sport Plus** The highest level of drive performance is made available in the “Sport” and “Sport Plus” modes. The V8 biturbo is active continuously in these modes. In “Sport” mode, the battery charge is always maintained at a minimum level to ensure that sufficient boost reserve capacity is available when needed. “Sport Plus” mode is all about maximum performance. In addition, the battery is charged as quickly as possible to ensure maximum performance.

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## Drive system

# **The technical details of the electric motor and the V8 biturbo**

The new Porsche is powered by an electric motor in combination with a V8 petrol engine adapted from the Panamera Turbo. The electric motor delivers 100 kW (136 hp at 2,800 rpm) and provides a maximum torque of 400 Nm (up to 2,300 rpm).

## **V8 biturbo with 4.0-litre displacement and 770 Nm of torque**

The eight-cylinder biturbo engine in the Panamera Turbo S E-Hybrid is a redesign. The design is compact and comparatively light, and delivers power of 404 kW (550 hp) between 5,750 and 6,000 rpm; the petrol engine produces a consistent torque of 770 Nm between 1,960 and 4,500 rpm. From a design perspective, the eight-cylinder biturbo is a longitudinally mounted V-engine with a bank angle of 90 degrees. The four variable inlet and outlet camshaft controls, which can each be adjusted by 50 degrees, are driven by chains. The displacement of the four-valve engine is 3,996 cm<sup>3</sup>, producing an outstanding specific output of 137.5 hp/l. The dominant technical characteristics of the V8 direct fuel injection engine are a central turbo layout with two internal-V turbochargers and injectors positioned in the centre of the combustion chamber. Other distinguishing features include a race-track-compatible oil circuit (layout designed to compensate for extreme longitudinal acceleration and latitudinal acceleration) and a virtually wear-free coating on the cylinder tracks.

## **Two twin-scroll turbochargers with up to 2.0 bar boost pressure**

The V8 petrol engine is exceptionally agile in all speed and power ranges. Even at low speeds, the eight-cylinder machine is a powerhouse of torque. These drive characteristics are achieved, in part, thanks to the twin turbochargers in the central turbo layout. Two twin-scroll turbochargers supply compressed air to the combustion chamber of the V8. The counter-rotating turbines provide high torque values even at low speeds. The maximum boost pressure of the turbochargers is 2.0 bar. On each turbocharger, a compressor driven by the exhaust gas flow compresses the intake air. To optimise engine response, this process air is directed through a two-tract

system – after flowing through the charge-air coolers to the left and right in front of the V8, the outside air is guided into the left and right cylinder banks, passing through a throttle valve on the way. The charge-air cooler significantly reduces the temperature of the process air, which has been heated up during compression. This process increases the density of the air, which in turn increases the amount of oxygen in the cylinder, boosting the overall efficiency of the engine. The fuel is injected by injectors equipped with high-pressure injection valves positioned in the centre of the combustion chamber. Porsche has created specific injection strategies that are deployed during engine start-up and to rapidly warm the catalytic converters, to achieve a short warm-up phase and to optimise the injection process while the engine is running at operating temperature. Each cylinder bank is equipped with its own high-pressure pump: The maximum injection pressure is 250 bar.

### **Exhaust gas after-treatment with catalytic converters in internal-V layout**

The V8 engine is equipped with a two-tract exhaust system with primary and main catalytic converters and front and rear mufflers. Analogue to the central turbo layout, the eight-cylinder engine is designed with a close-coupled internal-V catalytic converter layout; this configuration enables the emission control system to reach its optimum operating temperature quickly. Furthermore, the action of opening the turbocharger wastegate valve accelerates the warm-up process of the catalytic converter during the start phase.

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Connectivity and interior concept

## **Porsche Advanced Cockpit with hybrid-specific displays**

A particular highlight of the second-generation Porsche Panamera is its display and control concept, in the form of the standard Porsche Advanced Cockpit with touch-sensitive panels and individually configurable displays. The interactive cockpit takes the form of two seven-inch screens. The Panamera Turbo S E-Hybrid is distinguished from other cars in the model line by its unique power meter for hybrid driving, with an acid-green indicator and “turbo S” logo. The power meter provides data such as the amount of electrical energy currently being used or the energy being recovered through recuperation.

A 12.3-inch touchscreen in the centre console functions as a central PCM control and display unit, via which the driver can access various items of hybrid-specific information. The boost assistant and hybrid assistant are both practical and informative. The boost assistant display shows the energy available for boosting, while the hybrid assistant provides various visual signals for regulating the electrical drive power.

Among the other “Porsche E-Performance” features are the Sport Chrono Package as standard. This includes the MODE switch integrated in the steering wheel, which is used to activate four different driving modes. As in the case of the other Panamera models equipped with the Sport Chrono Package, these are the familiar “Sport” and “Sport Plus” modes as well as the “Sport Response button” for accessing maximum performance. The two hybrid-specific modes “E-Power” and “Hybrid Auto” are also included. Two additional modes – “E-Hold” and “E-Charge” – are controlled via Porsche Communication Management (PCM). (For a detailed description of the hybrid-specific modes, see the “Next-level performance” chapter.)

### **The Porsche Advanced Cockpit – digital display and control elements**

The Porsche Advanced Cockpit is provided as standard in the Panamera. Analogue indicators have generally been replaced with high-resolution displays, with one exception: The analogue tachometer remains, and is designed to pay homage to the Porsche 356. From the ergonomic low seat position, the driver enjoys views not only of the sporty front wings and power dome,

but also of the two seven-inch displays installed directly in his line of vision, which each feature two round instruments as standard. The analogue tachometer with integrated power meter sits between these two displays. As is common practice at Porsche, the speed is also shown digitally on the analogue tachometer. To the left is the virtual tachometer. In the centre, information on the assistance systems and other hybrid-specific information is clearly displayed. This instrument is called “Speed & Assist”. To the right of the tachometer and power meter is the “Car & Info” display. The driver can use this to customise and view vehicle settings or display information from the on-board computer. Alongside the “Speed & Assist” and “Car & Info” displays, the driver can select from a defined range of options to individually configure two smaller round instruments. The entire system is controlled via the buttons on the multi-function steering wheel.

### **Porsche Communication Management (PCM)**

The switch panel between the driver and passenger is dominated by the 12.3 inch touch-screen display of the Porsche Communication Management (PCM). The driver can personalise a sub-area of the home screen using tiled windows. The display is operated using multi-touch gestures. As with a smartphone or tablet, navigation maps, for example, can be rotated in any direction with two fingers. The display also recognises handwriting, which means the driver can simply write the navigation destination on the screen.

As soon as a hand nears the PCM, it is detected by a proximity sensor and a sub-menu bar that offers additional context-related functions opens in the left of the display. If a sub-menu contains multiple pages, the user can simply scroll through the pages by swiping just like with a smartphone. On the right-hand side of the display, the driver can open tiles, or widgets, and arrange them to personalise the layout. Depending on the driver’s preferences or the situation, the widgets can be used to display navigation information, the current playlist or air conditioning information. The widgets enhance the main menu of the PCM with individually customisable displays. The PCM can also be expanded with the addition of a CD/DVD autochanger, a digital radio, a Burmester® sound system (Bose® sound system is standard on the Turbo S E-Hybrid) and a Porsche Rear Seat Entertainment System.

## Controlling the hybrid functions via Porsche Connect

One of the standard functions of PCM is Porsche Connect Plus. This interface to the online world includes Apple® CarPlay and the Porsche Car Connect app (PCC). Drivers of Panamera hybrid models can use the app on their smartphone or Apple® Watch to access hybrid-specific Car Connect services, including battery and charge management and the ability to control hybrid functions remotely. The battery and charge management feature, for example, allows the driver to view important information on the charge status of the car, including the purely electrical range and total range, the current charge levels of the hybrid battery and the remaining charging time. The remote control function enables the driver to control hybrid-specific functions, including starting the charging process or setting the latest possible charging finish time. The user can also use the app to adjust the standard air conditioning system and thus cool or heat the passenger compartment before starting the engine.

The smartphone and Apple® Watch apps can also be used to control other PCC functions, including Safety Services (breakdown assistance and automatic emergency calls), Security Services, vehicle statistics, vehicle status and Carfinder, speed fencing and geo-fencing and the Porsche Vehicle Tracking System (PVTs Plus). With speed fencing, the app warns the user when the car exceeds a defined speed when being driven by a third party; geo-fencing informs the user when the Panamera leaves a specific area. PVTs Plus refers to a theft detection system with a location and tracking feature.

PCM also includes an LTE telephone module with SIM card reader, wireless Internet access (Wi-Fi hotspot), real-time traffic information, Google® Earth and Google® Street View. The Porsche Connect App (PCM Connect) provides another level of online interaction; this app is also part of the standard Porsche Connect Plus package. PCM Connect enables the driver to search for the required destination using a smartphone and Google before getting behind the wheel, and then to transfer this saved destination to PCM in the car. Calendar entries and contacts with address information can be displayed, updated and set as destinations in PCM. A further innovative new feature Alternatively, smartphone photos linked with GPS data can also

be used as navigation destinations. The Panamera also uses PCM Connect to access a virtually unlimited online selection of Internet radio stations and online streaming services. Songs are streamed using services such as Napster and radio.net.

Connect Plus also offers apps such as “Parking” (search for and check availability of parking spaces), “Fuel prices” (search for fuel stations and check prices), “Dictate messages” (dictate and send an SMS using voice control), “Twitter” (tweets are read out; information is displayed), “Train information”, “Flight information”, “Weather” (current location or destination), “Event info” and “Messages” – all of which can be easily activated as menu items in PCM.

### **Centre console functions configured using Direct Touch Control**

The high-resolution, high-end display of the PCM area transitions harmoniously into the black-panel concept of the centre console with a shift-by-wire gear selector gate for the PDK. In the centre console, a control panel with a high-quality glass look and touch-sensitive buttons offers intuitive control of various functions for vehicle and climate control. Even the slats of the central air vents can be electrically adjusted via a sensitive slider function. In the Panamera Turbo S E-Hybrid Executive, rear-seat passengers benefit from a four-zone automatic climate control system, which is installed as standard and adjusted via a seven-inch black panel dedicated to climate control and infotainment functions.

### **Two sound systems delivering 710 and 1,465 watts respectively**

The Panamera Turbo S E-Hybrid is equipped with a Bose® sound system as standard. Key information: 14 loudspeakers including passive subwoofer, 14 amplifier channels and a total output of 710 watts. As an option on its top-of-the-range model, Porsche offers a powerful 1,455 watt 3D high-end surround sound system by Burmester®, with 20 directly controlled speakers and an active subwoofer. Two additional USB charging points and a 12-volt socket in the rear ensure that smartphones and tablets in the Panamera are kept fully charged – even if the playlists on these devices are in constant use as a media source for the sound systems.

## Porsche Rear Seat Entertainment

At the heart of the optional Porsche Rear Seat Entertainment system are two 10-inch touchscreens. These high-resolution, non-reflecting screens (1,920 × 1,200 pixels) attach to the backrests of the front seats and can also be used as tablets away from the Panamera. Sound for the Rear Seat Entertainment is played back via the loudspeakers integrated in the touchscreens, the vehicle sound system or Porsche Bluetooth® headphones. A wide range of digital sources can be used: PCM media can be accessed via the SD card, Jukebox, CD/DVD drive and USB stick. Passengers in the rear can also control the radio. Vehicle data can also be displayed, as well as the current navigation route with corresponding additional information. The Porsche Rear Seat Entertainment can also be used to enter the destination for the navigation system of the PCM. Rear-seat passengers can access all content in the Google® Play Store, significantly broadening the range of entertainment on offer. The Porsche Rear Seat Entertainment system can either be controlled via the touchscreens or the PCM. The Porsche Rear Seat Entertainment system uses the Android operating system. It features 32 GB of internal flash memory, which can be extended by means of a microSD card. The touchscreens also feature a camera for conducting video calls and chats.

## Sporty touring car with ample room for four

The new Porsche Panamera Turbo S E-Hybrid provides ample room for four people to travel in comfort; there is sufficient space in the rear for the car to be used as a chauffeur-driven vehicle. This is particularly true of the Executive model, which boasts a 150-millimetre wheelbase extension. Both versions feature three foldable rear seats in a 40:20:40 configuration. Depending on the seat configuration, the luggage compartment volume measures between 405 and 1,245 litres (Executive: 1,395 litres).

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Assistance and comfort systems

## **Networked intelligence: Night vision assistant and Porsche InnoDrive**

The Panamera Turbo S E-Hybrid is equipped with numerous standard or optional assistance systems to make the driving experience not only more comfortable and convenient but also safer – including Porsche InnoDrive and Night Vision Assist. Night Vision Assist uses a thermal imaging camera to detect people and larger animals at distances of up to 300 metres, and provides corresponding coloured warnings in the cockpit. The new Porsche InnoDrive with adaptive cruise control is another ingenious feature: Based on three-dimensional, high-resolution navigation data, it calculates, and subsequently activates, the optimum acceleration and deceleration values as well as gear selections and coasting specifications for the next three kilometres. In doing so, this electronic copilot automatically takes corners, gradients and maximum speeds into account. Other vehicles and current speed limits are detected by the radar and video sensors and included in the control process.

### **Night View Assist can alleviate critical situations in advance**

In Panamera cars equipped with Night Vision Assist, a thermal imaging camera at the front of the vehicle detects the infra-red radiation given off by all living things. A control unit determines the thermal differential image and feeds this information into the right-hand display (“Car & Info”) in the Porsche Advanced Cockpit. Initially, the image appears in black and white, As soon as the thermal imaging camera detects people or animals, they are clearly shown in yellow. The driver intuitively recognises these colour changes as an advance warning. If the situation is deemed hazardous, the image changes from yellow to red. At the same time, the “Speed & Assist” instrument (to the left of the tachometer) displays a “pedestrian” or “animal warning” symbol. The system is therefore able to distinguish between people and animals, which is important because wild animals in particular are unpredictable. The system also issues a sound warning. If equipped with Night Vision Assist, the Panamera is also fitted with optional LED Matrix headlights (PDLS Plus). These headlights rapidly flash three times if a pedestrian is located in

the range of the high beam (Matrix beam function), making it easier for the driver to spot the pedestrian while braking or attempting an evasive manoeuvre. Unnoticeable to the driver, the brakes are also prepared in advance to decelerate the Porsche as fast as possible.

The Night View Assist is active up to a speed of 250 km/h. The “animal warning” is automatically deactivated in urban areas to prevent false warnings, which could be triggered by a dog walking by on a lead. Technical heat sources, such as the engine of a car that has just been parked, are not detected by the Night View Assist.

### **Porsche InnoDrive including adaptive cruise control anticipates the road**

Porsche InnoDrive with adaptive cruise control is a particularly ingenious feature: Using the navigation data, it calculates the optimum acceleration and deceleration values for the next three kilometres, and activates them via the engine and the eight-speed PDK as well as the brake system. In doing so, the electronic co-pilot takes corners, gradients and maximum speeds into account. It detects the current traffic situation using a radar and video sensors and adjusts the control process accordingly. Porsche InnoDrive – an innovative system developed by in-house Porsche engineers – significantly improves the efficiency of the Panamera Turbo S E-Hybrid, enabling vehicle functions such as coasting, trailing throttle fuel cutoff and braking interventions to be controlled more efficiently than ever before using predictive navigation data.

Porsche InnoDrive also offers clear benefits in terms of comfort and dynamics when using the adaptive cruise control system. The system even recognises roundabouts, and adjusts the vehicle speed to match the circumstances ahead. When “Sport” mode is activated, Porsche InnoDrive switches to a dynamic map. As with the classic distance regulator, the radar-video sensors also monitor the distance to the traffic ahead and permanently adjusts this distance accordingly.

The range of assistance systems has been expanded for those situations in which even the fun of being in a Porsche is limited: traffic jams. The traffic jam assist system supports the driver through integrated longitudinal and lateral control of the car in congested traffic situations at

speeds of up to 60 km/h. It does this by following a detected tailback under ACC control and combining this with steering assistance via the electromechanical steering system, which can be easily overridden at any time.

### **Adaptive cruise control increases comfort and safety on the motorway**

When the latest Panamera was launched in the middle of last year, the functions and performance of the adaptive cruise control system were vastly improved: Instead of just one radar sensor (normally integrated in the centre of the front section), two are now used in the second-generation Panamera; these are positioned to the left and right in the bumper. The adaptive cruise control system also uses information from the camera sensors. This system enhancement results in more reliable monitoring of the distance from vehicles in front. In addition, vehicles merging in from the side from the adjacent lane are detected significantly sooner. If necessary, the system brakes the vehicle until stationary. Thanks to a stop-and-go function, the Panamera also pulls off again automatically. If it is stopped for longer than three seconds, a short tap on the accelerator pedal or a restart via the control stalk is needed to move off again. The automatic distance control is active between the speeds of 30 and 210 km/h. Where possible, the system also makes use of the coasting function (engine in neutral, open clutch) to further reduce fuel consumption.

### **Lane Change Assist offers clear safety benefits**

Lane Change Assist uses two radar sensors in the rear bumper to detect the distance to and speed of vehicles approaching from behind in the adjacent lane. If both values are deemed critical, a visual warning is shown in the relevant exterior mirror, significantly reducing the risk of the driver missing a car in his blind spot. The system detects vehicles at a distance of up to 70 metres and can be activated between speeds of 15 and 250 km/h. Below this speed range, the rear turn assist can alert the driver of vehicles approaching from the rear in turning situations.

## **Lane Keeping Assist including traffic sign recognition**

Lane Keeping Assist is designed to reduce the risk of leaving the lane unintentionally – one of the most common causes of accidents on country roads. The system in the Panamera detects lane markings using a camera integrated into the windscreen, and works at speeds of 65 to 250 km/h. If the driver leaves his lane without indicating, the new electromechanical steering system automatically counter-steers against the manoeuvre. If required, an acoustic and visual warning in the instrument cluster can also be activated in the PCM. Traffic sign recognition, which uses the same camera as Lane Keeping Assist, is part of the system. It displays the detected speed limit as well as overtaking restrictions and additional signs that are stored in the digital map and compared with the signs detected by the camera. In the new Panamera, traffic sign detection has been expanded to include a useful feature: cornering information, which gives the driver early notification of tight corners.

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## Chassis and chassis systems

### **Wide balance between performance and comfort**

In keeping with the overall concept of the Panamera, the chassis combines the ride comfort of a luxury saloon with the performance of a true sports car. The basic chassis layout is complemented by a multitude of innovative systems designed for maximum comfort and performance. Virtually all of these assistance and convenience systems are part of the standard specification of the new Panamera Turbo S E-Hybrid – including adaptive air suspension with Porsche Active Suspension Management (PASM), the active chassis control system and anti-roll system Porsche Dynamic Chassis Control Sport (PDCC Sport) with Porsche Torque Vectoring Plus (PTV Plus) and the Porsche Ceramic Composite Brake (PCCB). In the Panamera Turbo S E-Hybrid Executive, which features an extended wheelbase, rear-axle steering is standard. By integrating rear-axle steering, Porsche is bringing the steering precision and handling characteristics of the sports car to the luxury saloon class. In all Panamera models, the integrated Porsche 4D Chassis Control system analyses and synchronises all chassis systems in real time, providing data which is used to optimise handling.

### **Based on a harmonious axle concept**

At the front of the Panamera, Porsche deploys double wishbone suspension with forged aluminium wishbones and hollow-cast lightweight aluminium swivel bearings. A hydraulically damped elastomer bearing on the lower wishbone is designed to boost comfort. The anti-roll bar link on the pivot bearing also enables the use of monotube dampers, which optimise comfort. In combination with electromechanical steering, the rigid aluminium auxiliary frame guarantees a dynamic performance and agile handling. The rear axle uses a lightweight multi-link suspension with forged upper aluminium wishbones and hollow-cast lower aluminium wishbones. Here, too, optimised axle and elastokinematics enhance agility, precision and comfort.

## **Rear-axle steering as standard in the Panamera Turbo S E-Hybrid Executive**

The Panamera Turbo S E-Hybrid Executive is equipped as standard with rear-axle steering, which is available as an option on the short wheelbase version. At low speeds of up to around 50 km/h, the rear wheels steer in the opposite direction to the front wheels – variable across the vehicle speed – up to a maximum steering angle of 2.8 degrees. This approach effectively shortens the wheelbase. The advantages include more dynamic cornering and significantly improved manoeuvring and parking in tight spaces. At speeds above around 50 km/h, the rear wheels turn in the same direction as the front axle depending on the on the speed. Here, rear-axle steering serves to effectively lengthen the wheelbase, which increases stability, for example when changing lanes on the motorway. Rear-axle steering is an active safety system that optimises drive dynamics; it also boosts comfort by reducing the required steering angle at low speeds. The integration of rear-axle steering also results in a more direct steering ratio on the front axle for an exceptionally sporty steering experience.

## **Integrated Porsche 4D Chassis Control**

Porsche 4D Chassis Control is a centrally networked system. It analyses the current driving situation centrally in all three dimensions (longitudinal, lateral and vertical acceleration), uses these findings to calculate optimum information about the driving status, and makes this information available to all chassis systems uniformly and in real time – creating a fourth dimension in chassis control. As a result, the systems are able to respond to the imminent driving situation in an integrated manner. By way of example: When steering dynamically into a bend, the electronic damper control system PASM, the adaptive air suspension, rear-axle steering, PTV Plus and PDCC Sport systems work together to ensure optimum steering behaviour, exceptional agility and stability. Porsche 4D Chassis Control issues a pulse to the chassis systems as soon as the car starts steering into the corner. This means that the systems are able to respond promptly and ensure maximum performance around bends.

## **Porsche Active Suspension Management (PASM)**

Porsche Active Suspension Management (PASM), which is also part of the standard specification, is an electronic damping control system. The system responds to the road condition and driving style, using the information it gleanes to adjust the suspension on each individual wheel. The dampers in the latest Panamera also boost responsiveness, fine-tuning the balance between comfort and sportiness. Three driving modes are available: “Normal”, “Sport” and “Sport Plus”. The PASM functions as follows: Sensors monitor the body movements such as those that occur during heavy acceleration, braking, fast cornering, or on uneven road surfaces. The PASM then sends the captured data to the Porsche 4D Chassis Control. The control centre determines the current driving conditions and, depending on the active mode, sets the damper hardness for PASM and the damper characteristics and spring rates for the adaptive air suspension system. The 4D Chassis Control also coordinates the control parameters of the other electronic chassis systems. The result: enhanced vehicle stability, performance and comfort.

### **Adaptive air suspension with PASM**

The Panamera Turbo S E-Hybrid is equipped with an adaptive three-chamber air suspension system as standard. In terms of comfort levels in particular, the adaptive air suspension sets new benchmarks. It has been vastly overhauled compared to the air suspension of the first-generation Panamera. The current system has three instead of two switchable air chambers per spring strut and around 60 per cent greater air volume. This enables a considerably larger spread of the spring rates. The chassis can be set to a lower basic spring rate for increased comfort, as the spring rate can be changed electronically in a fraction of a second where necessary – for example, during acceleration and braking or to reduce rolling motion.

The air suspension also offers the familiar advantages of the self-levelling function. In addition to the Normal Level, the system also offers a Lift Level and Low Level. The lift level raises the chassis by 20 millimetres, which can help to prevent damage to the front spoiler, for example, when entering underground car parks. The Low Level lowers the front axle by 28 millimetres and the rear axle by 20 millimetres to perfect the vehicle position on the road at high speeds and improve the aerodynamics.

## **Active anti-roll stabilisation PDCC Sport including PTV Plus**

The Porsche Dynamic Chassis Control Sport (PDCC Sport) system optimises driving dynamics through the integration of electromechanical anti-roll bars. The system reacts significantly quicker than systems with hydraulic actuators and stiffens the anti-roll bars to prevent rolling of the body. In the Panamera, Porsche combines PDCC Sport with Porsche Torque Vectoring Plus (PTV Plus). The electronically controlled rear differential lock ensures that the drive torque is distributed in varying proportions across the rear wheels, while wheel-selective braking interventions generate additional steering torque on the rear axle – The result of this is even more agile steering behaviour. PTV Plus also delivers a noticeably higher level of traction when accelerating out of bends through targeted use of the differential lock.

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## Exterior

# The design of the new Panamera is a bridge to the Porsche 911

The new Panamera Turbo S E-Hybrid is based on the second generation of this model line. The car is 5,049 millimetres long, 1,937 millimetres wide (excluding exterior mirrors) and 1,427 millimetres tall. The wheelbase measures 2,950 mm. The wheelbase of the Panamera Turbo S E-Hybrid Executive measures 3,100 mm; the Executive model is 5,199 mm long and 1,432 mm tall. In both body versions, the car's long length and width, combined with its comparatively low height, result in an exceptionally dynamic vehicle design. The team working with Porsche Head of Design Michael Mauer used these proportions to develop the Panamera – a sports car in a class of saloons.

## Prominent wings and a sports-car-style power dome

Front: The Panamera is a wide Gran Turismo of impressive proportions. The visual effect is amplified by the A-shaped air intake at the front of the car. At the same time, a precisely designed crossbar in the radiator grille emphasises the width. The arrow-shaped bonnet has a long and low aesthetic thanks to the unique contours of the power dome, with lines reaching down to the bumper. The flat frontal design of the Panamera Turbo S E-Hybrid is possible thanks to its compact plug-in hybrid drive. To the left and right of the power dome, the high-precision contoured wings – one of the most recognisable Porsche design characteristics – flow from the bonnet. The LED headlights – available in three versions with four-point LED daytime running lights – create a sophisticated look.

## Roof with charismatic Porsche flyline

Silhouette: With its dynamic sloping roof, the sides of the car reflect the typical sports car silhouette. At the rear, this sloping roof flows into the charismatic Porsche flyline – a unique design characteristic used on all Porsche coupés. The two clear lines running along the side of the roof create a lowering effect. The unique side windows appear to form a single, uninterrupted unit, in a deliberate aesthetic reference to the familiar lines of the Porsche 911. The

doors and wings are three-dimensional; convex and concave shapes exploit natural light to create a muscled, rippling surface. The air outlets behind the front wheels are an integral part of the design. The edges of the angled wheel arches are another powerful design feature, drawing the eye to the 21-inch alloy wheels – standard in the Panamera Turbo S E-Hybrid and the Executive version – underneath.

### **LED light strip and 4-way rear spoiler**

From behind the car, it becomes crystal clear that the Panamera is a four-door coupé rather than a conventional saloon. The greenhouse – the roof, roof pillars and windows – is supported on strong, wide shoulders: A clear Panamera characteristic that is unequivocally sports car. From the rear, the most distinctive feature by far – alongside the three-dimensional Porsche lettering – is the three-dimensional LED rear light system with integrated four-point brake lights; the rear lights are connected by a narrow strip of LEDs. All of these elements combine to form a unique and unmistakable night design. Integrated seamlessly into the standard electronic tailgate is the retractable rear spoiler, which is now in the same colour as the main body of the car. When extended, the four-way wing of the top-of-the-range model splits, increasing its surface area. Along the bottom edge of the rear is a diffuser, with the brushed stainless steel twin tailpipes of the exhaust system integrated into its left and right ends.

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## Standard equipment

### **Air suspension, 21-inch wheels and ceramic brake as standard**

Like the 4 E-Hybrid, the second plug-in hybrid model in the Panamera series also features adaptive three-chamber air suspension with Porsche Active Suspension Management (PASM) and Porsche's all-wheel drive system, Porsche Traction Management (PTM), as standard. The extended standard equipment of the Panamera Turbo S E-Hybrid includes the active chassis control system and anti-roll system Porsche Dynamic Chassis Control Sport (PDCC Sport) with Porsche Torque Vectoring Plus (PTV Plus), 21-inch alloy wheels in 911 Turbo design and the Porsche Ceramic Composite Brake (PCCB). The new Panamera Turbo S E-Hybrid is also available in an Executive version, with a 150-millimetre longer wheelbase and rear-axle steering as standard. In China, only the 5,199-millimetre Executive model will be available.

Hybrid-specific equipment includes the Porsche Universal Charger with transport bag and wall mount, a vehicle cable to connect the control unit and the car (2.5 metres) and two supply cables (one to connect the control unit to the domestic electrical outlet; the other to connect the 400-volt industrial electrical outlet to the operator control unit).

### **Extensive range of colours as standard**

The external look of the top-of-the-range Panamera model is characterised by its brushed stainless steel twin tailpipes, the 'e-hybrid' logo on the side and the model name on the tailgate in silver (high-gloss) with "Acid Green" edging, brake callipers in "Acid Green", LED main headlights with the Porsche Dynamic Light System (PDLS) and the automatically retractable four-way rear spoiler. The Panamera Turbo S E-Hybrid can be painted as standard in non-metallic "Black" and "White", or metallic "Carrara White Metallic", "Jet Black Metallic", "Vulcan Grey Metallic", "Rhodium Silver Metallic", "Sapphire Blue Metallic", "Night Blue Metallic", "Agate Grey Metallic", "Mahogany Metallic", "Burgundy Red Metallic" and "Ristretto Brown Metallic". Optional special colours and individual paint finishes are also available.

## **14-way seats, Bose® sound system and full leather interior**

The range of standard equipment inside the vehicle has also been expanded. The Panamera Turbo S E-Hybrid is equipped as standard with auxiliary air conditioning, front comfort seats with electrical 14-way adjustment and memory package, heated seats front and rear, leather interior in “Black”, “Saddle Brown”, “Agate Grey” or “Marsala”, electrically adjustable (height and position) multi-function steering wheel, wood interior package in Dark Walnut, roof lining, door posts and sun visors in Alcantara and a 710-watt Bose® sound system.

## **Extended and individualised equipment for Executive model**

The Panamera Turbo S E-Hybrid Executive comes with even more equipment as standard. On the outside, the Executive models are identified by small yet elegant embellishments: On the sides, there are two high-gloss silver strips in the door sills complemented by matching air outlet trims in the front wings. The front section features a decorative strip on the air intake, again in high-gloss silver. In some markets, the D-pillars also feature silver “Executive” lettering. The Panamera Turbo S E-Hybrid Executive is also supplied as standard with ambient lighting, a feature that allows the owner to choose from seven different interior lighting concepts with lighting focused at the rear of the car.

## **Panoramic roof system as standard in Panamera Turbo S E-Hybrid Executive**

All long-wheelbase Panamera models are equipped with a transparent panoramic roof system as standard. The front section of the roof can be raised up and fully opened. The transparent roof can also be covered with an internal blind. The extended standard equipment also includes electronic comfort seats with comfort headrests in the rear and a roll-up sunblind for the rear window. The car is also equipped with ParkAssist, including a reversing camera, and Soft-Close doors (with automatic closing mechanism). A large centre console with an additional smartphone slot (inductive antenna interface) has also been specially designed for the Executive models. This can be ordered as an option. This centre console can also be equipped with two aircraft-style folding tables, which can be stowed when not in use.

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## Special features

# **New Porsche Panamera is designed for individuality**

The likelihood of ever coming across two identical Panamera Turbo S E-Hybrids is very low for two key reasons. First, Porsche offers a wide range of options for the Panamera, with twelve standard exterior colours, ten interior colour and leather combinations and various special options. Secondly, in addition to the range of options available via the Configurator, the Panamera can also be tailored to the driver's own requirements via Porsche Exclusive. This level of personalisation is achievable thanks to the innovative Porsche manufacturing concept. This concept combines ultra-modern, digitalised and automated production processes with custom manufacture. For example, in addition to the colours available in the Configurator, Porsche is able to offer the Panamera Turbo S E-Hybrid in virtually any colour imaginable via Porsche Exclusive. The overview below describes a selection of the main options available for the Panamera via the Configurator (see separate chapter for assistance systems).

## **Leather and interior finish**

### **Five interior packages**

There is almost no limit to the customisation options available for the interior of the Panamera. Personalisation begins with one of five packages: the "Painted interior package", the "Leather interior package", the "Carbon interior package", the "Aluminium interior package" and the "Wood interior package". Depending on the option chosen, the decorative panelling on the switch panel and doors, and the decorative element on the centre console, are painted or finished in leather, carbon, aluminium or wood. The available wood finishes are "Dark Walnut" (standard on the Panamera Turbo S E-Hybrid), "Grey Birch", "Amber" or "Paldao".

### **Steering wheel in carbon or wood**

The multi-function steering wheel can also be ordered in leather/carbon or leather/wood; in both cases, the steering wheel comes with heating.

## **Driving dynamics**

### **Sports exhaust system**

Modified, original-design rear muffler with brushed stainless steel or high-gloss black sports tailpipes.

## **Exterior**

Side window trims in “High-Gloss Black”

### **“SportDesign” packages**

Individually designed SportDesign front end painted in the vehicle colour and with black air intakes and C-blades, SportDesign sideskirts and a SportDesign rear apron in the exterior colour with a black rear diffuser. Black elements can be ordered with a silk or high-gloss finish; SportDesign sideskirts are available separately.

### **Electrically extendible towbar system**

Ball joint can be electronically extended and retracted. Maximum towed weight for a braked trailer is 2,200 kilograms.

## **Light and visibility**

### **LED Matrix main headlights including PDLS Plus**

The new LED Matrix headlights with Porsche Dynamic Light System Plus (PDLS Plus) are designed to put the Panamera at the cutting edge of light technology. One LED Matrix main headlight contains a total of 109 LEDs used for all lighting functions. The LED matrix module alone contains 84 individually activated LEDs (pixels), which can be used in conjunction with lenses, reflectors and the dipped beam range as an adaptive high beam. The lights are connected to a camera in the windscreen. This camera detects vehicles ahead and oncoming vehicles and controls the distribution of the high beam so intelligently that no other road user is dazzled, while still providing maximum light on the road for the driver.

The complex headlight module not only relies on camera data, but also uses navigation data and vehicle information to autonomously control the 84 flexible diodes. This intelligent system for controlling the distribution of light also enables other comfort and safety features to be integrated into the vehicle. For example, the system uses the camera to detect reflective traffic signs that may dazzle the driver, and selectively switches off the lights directed at such signs to ensure that the driver's vision is not impaired. The LED Matrix headlights also boast an additional new feature for opposing traffic: The headlights not only dim the opposing traffic in segments, but also intensify illumination of your own lane using a boost function. This guides the driver's line of vision, improving comfort and safety. The dynamic cornering lights are operated electronically rather than mechanically.

## **Glazing**

### **Panoramic roof system**

On the launch of the second generation, the Panamera was offered with a panoramic roof system for the first time. The roof is made of two large glass surfaces. The front segment is a sliding and lifting roof, while the rear segment is a fixed pane of glass. With the light flooding in through the panoramic roof system, the interior is even brighter and more welcoming. Two electric roll-up blinds can be used to darken the interior in bright sunlight. (Executive series.)

## **Glazing**

For the new Panamera, Porsche offers dark-tinted privacy glazing in the rear, as well as thermally and noise insulated glass. The rear can also be equipped with electric roll-up sunblinds (side windows and rear window) to protect occupants against bright light or prying eyes.

## **Ioniser**

Ionisation technology is used to improve air quality inside the Panamera. Background: Ionisation reduces the amount of bacteria and harmful particles in the air.

## Seating

### **Adaptive Sports Seats at the front (electric 18-way adjustment) with memory package**

The highly ergonomic sports seats are differentiated from their conventional counterparts by their own unique seam construction and the increased height of the seat side bolsters. The rear seats also feature an individual design. In the front, the seat sides can also be adjusted; in total, the seat can be adjusted in 18 different ways.

### **Comfort seats/sports seats in the rear (8-way, electric) with memory package**

As an option, the individual seats in the rear are also available with electric adjustment (backrest angle, seat surface length and four-way adjustable lumbar support). The rear seats also feature a memory function. If the rear comfort seats in the Panamera are equipped with seat heating and ventilation, the rear seats can also be ordered with wider comfort headrests. (Executive series.)

### **Heated seats/seat ventilation/massage function**

The Panamera Turbo S E-Hybrid features front and rear heated seats as standard. The seats can also be ordered with an optional ventilation and massage function.

## Comfort systems

### **Soft-close doors**

Door closing mechanisms are automatically engaged when the door is shut. (Executive series.)

## Fuel consumption and emissions

**Panamera Turbo S E-Hybrid:** combined fuel consumption 2.9 l/100 km;  
combined energy consumption 16.2 kWh/100 km; CO<sub>2</sub> emissions 66 g/km

**Panamera Turbo S E-Hybrid Executive:** combined fuel consumption 2.9 l/100 km;  
combined energy consumption 16.2 kWh/100 km; CO<sub>2</sub> emissions 66 g/km