

Quiet speed ahead: sustainable mobility far beyond the automobile

16/10/2023 When it comes to sustainable mobility, Porsche thinks far beyond the automobile. Working with the Frauscher shipyard, the sports car manufacturer developed the Frauscher ×Porsche 850 Fantom Air, an innovative electric sports boat that has the potential to revolutionize an entire industry.

Jörg Kerner, Head of the Macan Series at Porsche, carefully pushes the throttle forward, and the powerful torque of the electric motor kicks in at once. He then maintains a speed of 20.5 knots (38 kmh), which he refers to as cruising speed. And as he accelerates again and we approach 100 kmh, what you'd expect to happen simply doesn't happen at all. There's no roar of the engine, nor does the bow raise straight up into the air. The Frauscher × Porsche 850 Fantom Air is gliding almost horizontally over the water of Italy's Lake Garda. Relaxed stance, unobstructed view. "We achieve this unique driving quality by centrally positioning the drive and batteries low in the hull," explains Kerner casually. Without all the noise, there's no need to raise his voice. There's a pleasant hum, accompanied by the rushing of water. "What surprised me the most was the high-quality, natural background sound," says Kerner with delight, demonstrating turning maneuvers that conventional boats could never perform.

“We even reduced the torque for the turns to maintain comfortable control.” The high-precision thrust and the stable position are also perfect for water-skiing and wakeboarding. “This sport wasn't possible with the small electric boats previously available. But now it is, and there's no smell of exhaust.” The boat measures just over two and a half metres in width and around eight and a half metres from bow to stern. “Length is a good thing,” says Kerner. “That not only applies to boats, but also to cars equipped with a wider wheelbase for more stability and space.” The eFantom can accommodate up to nine people. There's a first edition in the pipeline, which will be limited to 25 boats. These can be preordered through Frauscher and should be available in 2024.

Pioneer in sustainable mobility

The idea was born in spring 2021 at a meeting with Oliver Blume, Chairman of the Porsche Executive Board. Porsche aims to be a pioneer in sustainable mobility for race cars, street vehicles, and beyond.

The Porsche Executive Board initiated a new project and appointed Philip Ruckert as the “eBoot” (electric boat) project manager. Together with Porsche Engineering, the technical cornerstone was laid. Just a year later, the decision was made to integrate the project into the Macan Series and to make it ready for series production. Right at the start, Ruckert got in touch with the renowned Frauscher shipyard in Ohlsdorf, Austria. “We share a long history with Porsche,” said Michael Frauscher, who as CEO is responsible for production. “First, my grandfather built boats for the Porsche and Piëch families. Second, we were introduced to Porsche Consulting over ten years ago. It was, amongst other things, their advice that allowed us to develop from that workshop to the successful manufacturer we are today. They taught us not only to ensure high-quality production, but also to streamline the process.” The shipyard in Ohlsdorf currently has around 100 employees building 18 boats at the same time.

“And third, we share the same standards in terms of performance, design, and innovation with Porsche,” says Frauscher. “Our boats need to be uncompromisingly fast and beautiful.” Frauscher has been building small electric boats for rental companies since 1955, as even back then Michael's father was upset that outboard motors were polluting the seawater. “Eventually, we were the first company to offer hybrid drives and hydrogen. But the eFantom is a true revolution. I've been driving boats my whole life – and this is by far the best one I've ever driven. No boat with internal combustion engine could keep up.”

“The idea was followed by a feasibility analysis,” recalls Philip Ruckert. “During the 2021 concept phase, we decided to use the hull of the Frauscher 858 Fantom Air day cruiser as a basis and incorporate the ultra-powerful electric drive of the upcoming all-electric Macan. For a perfect balance between electric motor and sterndrive, we restricted its power to a maximum of approximately 400 kW.” The 2024 Macan will come equipped with the new PPE drive technology. The Premium Platform Electric was developed with sister company Audi and offers a common architecture for fully electric vehicles. It features a high-voltage lithium-ion battery with a total capacity of around 100 kWh, a permanent-magnet synchronous motor, and state-of-the-art power electronics.

Construction began in 2022

Frauscher adapted the hull of fiberglass-reinforced plastic to position the drive unit at an optimal, lower center of gravity. Adjustments were also being made at the same time at the Macan development project center in Hemmingen near Stuttgart.

All of the high-voltage components – the typical Porsche voltage is 800 – including the battery were incorporated without modification, as was the charging system with fast-charging socket on board. All of the active parts of the electric motor fit just fine, but not the housing. Rather than pedals, the boat features a throttle. The power is not transferred to the wheels, but from the electric motor to the propeller via the sterndrive shaft.

According to Kerner, the central electronic control unit required the most development. “Because you can’t measure wheel speed on the water or don’t have a parking brake, there were plenty of issues to be resolved. For example, the Macan only charges when the parking brake is activated. We first had to generate these and other missing signals.”

The test phase then began with the prototype. In September 2022, the development team took the prototype out for its maiden voyage on the Traunsee, a lake not far from the shipyard – barely a year later it is put to the test on the much larger Lake Garda. “The fast-charging function including charging station played an essential role during the trials and test-drives,” adds Kerner. “ADS-TEC was a great source of help with its ChargePost.” Due to its dimensions, the station provided by the company based in Nürtingen in the state of Baden-Württemberg, is reminiscent of an old phone booth. But with a fresh design featuring individually operated large displays.

The heart of the fast-charging station is a strong rechargeable battery that can be fed with a 22 kW connection, which is always available even at smaller ports. “The switch to electric boats doesn’t stand a chance without a simple infrastructure,” explains Kerner. “They are really only used where internal combustion engines are banned. But a success story requires fascinating products and highly sophisticated processes. With around one million euros for six fast-charging stations like this one, which are easy to install, all of Lake Garda could be made accessible to electric boats. That is a reasonable investment and it wouldn’t be much different for other lakes and coastal regions around the world.” For flexible structuring of daytime boat trips, brief stops and fast charging with direct current play an important part. AC charging is of course also possible. Naturally, the range depends on your speeds. The sporty cruising speed at 40 kmh can be kept up for 60 minutes – at top speed, the value is correspondingly lower.

“Even at the end of development, other manufacturers never achieve the sheer scale of engineering that Porsche started out with,” says Michael Frauscher with conviction. “And more importantly, our Frauscher ×Porsche 850 Fantom Air is not an exhibition piece, but a series model approved to the highest standard for which orders can already be placed.”

Info

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Path: Quiet Speed Ahead/Images/img_1.jpg
Title: Michael Frauscher, Jörg Kerner, Head of the Macan Series at Porsche, Frauscher × Porsche 850 Fantom Air, 2023, Porsche AG
Subline: Helmsmen: Michael Frauscher (left) is a third-generation boat builder. He got together with Jörg Kerner, Head of the Macan Series at Porsche, at the Frauscher shipyard, where the eFantom is being built. They both contributed expertise to the Frauscher ×Porsche 850 Fantom Air.

Path: Quiet Speed Ahead/Images/img_3.jpg
Title: Frauscher × Porsche 850 Fantom Air, 2023, Porsche AG
Subline: Fresh energy: A mobile charging station with a charging capacity of up to 255kW was used for the prototype test.

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