

# Electric mobility on the water 2021

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### Rough seas make good sailors

There's an old seafaring proverb: some things are best learned in calm, and some in storm. Global perspectives are changing as we deal with the disruption to lives and livelihoods caused by the coronavirus. It has reset priorities and shifted our focus toward building a more sustainable and healthier , economic system with investments in renewable energy, electrification, efficiency, smart mobility and more resilient infrastructure. At Torgeedo, we are at the forefront of innovation, building products that will advance a green recovery that addresses the climate crisis.

Our goal is to make the switch to electric boating easy for boaters and boat builders alike. To accomplish that, we do more than just design systems that \_\_\_\_\_ and control system initially developed for Deep Blue. are socially, ecologically and economically advantageous. We build products which perform beautifully and drive the transition to climate-neutral mobility. We have built strong market leadership in the small outboard segment, and for the 2021 boating season,

Torgeedo will launch a lighter, more affordable Travel motor: the Travel 603 (p. 26). It's a 2 HP-equivalent, direct-drive outboard with a built-in lithium battery perfect for tenders, small sailboats, and other applications with suitable range requirements. The Travel 603 ships with a 500 Wh floating battery pack and all the high-tech features you expect from a genuine Torgeedo product. The best-selling Travel 1103 will continue as our class-leader for the small outboard segment.

The 20 HP-equivalent Cruise R outboard and fixed pod motors receive a technical update for the new boating season. These flagship products now ship with TorqLink (p. 31), a high-tech communications Our new throttle with a vivid and colourful onboard display (p. 35) also has TorqLink built in to allow an easy connection to your TorqLink equipped drive system.

Thanks to our cooperation with ZF, two powerful new saildrives for Deep Blue (p. 44) are now available to our customers and boatbuilding partners. Deep Blue 100 i continues to transform recreational boating, and foiling technology is opening up more applications for zero-emission drive systems. As ever, we continue to focus on safety, reliability and performance as we create the future of how people move on the water.

These transformative times have proven that we can come together and rise to meet a challenge, and we must also act to reduce climate change. When you buy a Torgeedo product, you're doing more than purchasing a high-tech electric drive system from the market leader. You're part of a sustainable mobility transformation.

Welcome aboard.

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### Update for 2021:

Cruise 10.0 R with TorqLink



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### 40 Deep Blue

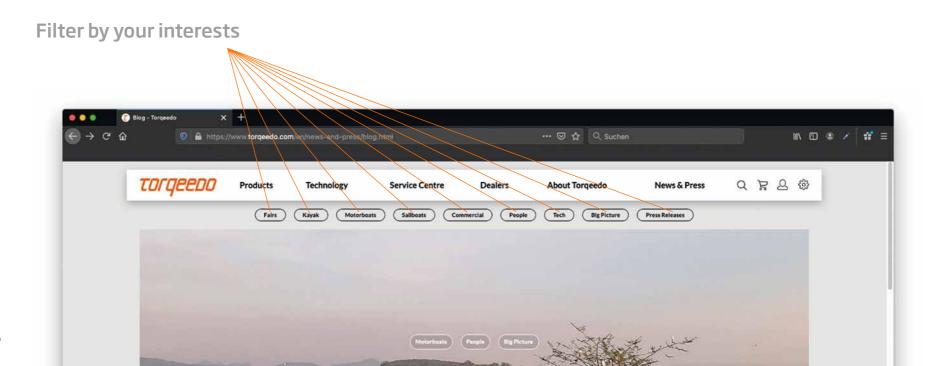
Flexible and scalable, this perfectly integrated system is winning over yacht owners and commercial operators.

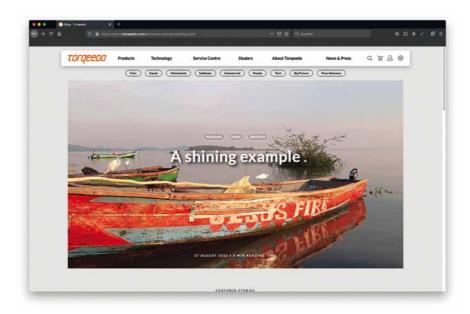
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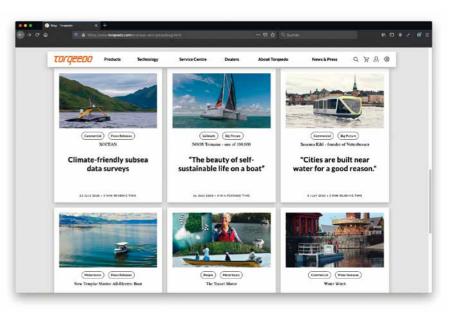
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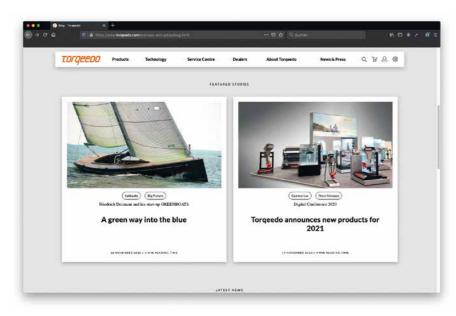


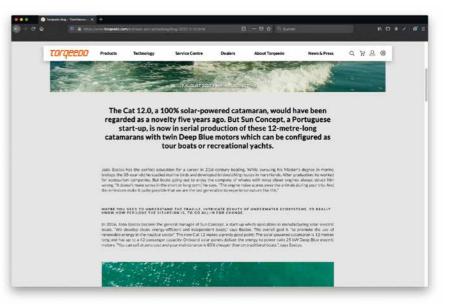
### www.torqeedo.com/en/ news-and-press/blog.html











# Turning the tide

Switching makes a difference. Electric boats are cleaner and healthier for you, your community and our planet

If you spend time outdoors and on the water, you are likely to have noticed a change. According to the NOAA\* analysis of global temperatures, nine of the ten warmest years have occurred since 2005. The five hottest years since 1880, when recordkeeping began, were the last five years. 2019 was the second-hottest year in the 140-year record. Ocean temperatures are rising, as fishermen report species that have sustained coastal communities for ages are vanishing. Coral reefs, so fragile and beautiful, so critical for aquatic life, are suffering from warming and ocean acidification.

### The science is clear

Global temperatures are currently predicted to reach 1.5° C above pre-industrial levels between 2030-2052. The science is clear: We have to reduce our greenhouse gas emissions by 45% over the next 11 years to avoid further warming – and the most harmful impacts of climate change. Reaching this goal will require the reinvention of our lifestyle. The good news is that the technology for a carbonneutral mobility is here – and getting more powerful every day.

### Electric boats have lower climate impact

Boats powered by electric motors have a significantly lower climate impact than combustionpowered boats. Even when charged with electricity from a coal-fired power plant, CO<sub>2</sub> emissions are reduced by approximately 30%. When charged via renewables, the climate impact is reduced by up to 90%.

Until recently, little attention was paid to the air pollution caused by combustion engines on boats. They are allowed to emit up to 100 times the level of harmful substances permitted in automotive diesels and include very little technology for filtering out pollutants. If you drive an 80 HP boat for one hour, it's like driving 350 new cars at highway speed for the same amount of time.\*\* It's no wonder that in cities with a lot of boat traffic, air pollution from fine particles is up to 20 times higher than accepted levels. If you switch to an electric drive, you are not only reducing your carbon footprint; your local community and waters will benefit as well.

Electric boats cause no water pollution because they don't discharge their exhaust underwater like combustion engines and there is no chance of fuel or oil spilling on the boat or fouling the water. They are also quieter than fossil fuel-powered boats, as their noise disturbs people on land and wlidlife under water. With an electric motor the only sound you hear are the sounds of nature.

### For now and the future

Boaters are keen to preserve nature and enjoy clean air and unpolluted water – for today's enjoyment and tomorrow's generations. Torqeedo creates the products for the transition to sustainable boating. It's what we've been doing all along.

\* National Oceanic and Atmospheric Administration

\*\* Sources: United States Environmental Protection Agency, California Air Resources Board, Environmental Capital Group



### **Zero pollution**

Even a drop of spilt petrol can contaminate thousands of litres of water. Electric drives eliminate the oily film that forms where combustion engines are used.

Peace and quiet Electric motors are quieter and cause less vibration on board than a typical combustion engine.

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### Healthier air and climate

Electric motors do not emit toxic substances and typically have a lower carbon footprint due to their superior efficiency and lightweight design.



### Abundant green power

Solar panels can help keep batteries charged and some electric motors can charge their own batteries - the spinning prop acts as a hydrogenerator and supplies free, clean energy while the boat is under sail.



### More energy onboard

With increased battery capacity, everything from the water maker to the tender can be electricpowered, further reducing climate impacts.

**Convenient charging** 

Charging is quick and easy – most marinas are already equipped with shore power connections.

# Charting a new course

Digitalisation, electrification and autonomous vehicles are changing how we get around. Torqeedo is bringing new mobility onto the water – and you can profit from the new technology

How we move people and products – in fact, our entire mobility culture – is changing. Today, we navigate the ever more complex urban infrastructure with our smartphones, changing from renta-bike to Uber pool to subway travel in an instant. Digitalisation and connectivity are driving a mobility revolution not seen since the advent of combustion engines.

### Waterways as a way out

These new, smart and interconnected mobility services are also extending onto the water. By 2050, the global population is projected to reach 10 billion, with 75% of people living in cities. Facing this rapid population shift and the resulting gridlock of landbased transportation, urban planners are looking to the waterways that grace many metropolises to ease the burden on the road and rail infrastructure.

Many old canals and rivers that had been covered by concrete for decades are being reopened and integrated into public transport networks. Eight allelectric commuter ferries are operating in Bangkok, Thailand, powered by twin Torqeedo Cruise 10.0 electric outboards. Electric ferries are contributing to cleaner air in metropolitan areas and lowering the carbon footprint of on-water transport. Commercial vesels cover their roofs and sunlit surfaces with solar panels to generate energy and reduce pollution, or even go completely emission-free.

Because of the focus on building a climate-neutral economy, electric mobility is growing exponentially year after year.

### A smart business choice

The mobility revolution goes beyond exchanging motors; the whole operational system is being reprogrammed. Amsterdam is the first large city to have started trials of autonomous transport



boats for goods distribution. On urban canals or rivers we will soon see autonomous ferries or water taxis that can be ordered by smartphone. As 21stcentury technology shouldn't be powered by 20thcentury engines, electric motors are the propulsion technology of choice for this new application field. Smart, connected electric mobility means the world's great cities can improve their air and water quality, protect the climate, and simultaneously improve their citizens' quality of life. We're proud to be part of this global transformation. But the switch to electric is also a smart business choice: reduce operating costs, improve the user experience and minimise your carbon footprint, while setting your company apart. Powering your business with environmentally friendly drive systems from Torqeedo may even provide a competitive advantage for funding, official permits and customers in the marketplace.





### Now is the time

Torqeedo provides a complete, integrated and proven electric propulsion system for your commercial project. With a battery capacity warranty of up to nine years and worldwide service, now is the time to lower your operating costs and carbon footprint with a high-tech electric mobility system from Torqeedo.

### It all adds up

Save 100% of your petrol or diesel costs and instead:

- + Spend a fraction on electricity and battery write-off
- + Reduce maintenance costs
- + Enjoy high reliability

= If you're out on the water 100 days a year or more, you may save money by going electric.

### What we offer



**Diagnostics and service:** Torqeedo specialists can solve many hardware and software issues remotely.

Q (i)

**Experts on call** to answer questions or schedule service.



**On-site support:** A Torqeedo technician will arrive at your place of business within 18–48 hours

We'll be pleased to provide you with a calculation customised to your requirements:

info@torqeedo.com

# Superior efficiency and performance

Our focus on optimising propulsive power and overall efficiency

### Measuring power and performance

The most meaningful performance indicator of a drive system is propulsive power, which indicates the power delivered by the motor to drive the boat, while taking all losses, including propeller losses, into account. This method has been used in commercial shipbuilding for nearly 100 years.

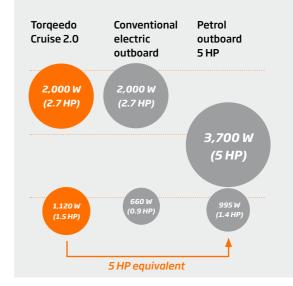
Manufacturers of combustion engines often advertise less informative measurements, such as the shaft power, input power, or even the static thrust. That wouldn't be so bad if the differences between power ratings were minimal, but that isn't the case: a petrol outboard with an advertised shaft power of 5 HP actually provides a mere 1.4 HP of propulsive power.

### The efficiency advantage

Torqeedo efficiency ratings not only refer to motor efficiency, but also disclose losses in motor, electronics, cables, gears and propellers. Thanks to our focus on optimising the entire system, Torqeedo motors deliver the highest overall efficiency on the market. When combustion engines burn petrol or diesel, they primarily use the stored energy to produce heat: 5-15% of the supplied energy is used to propel the boat and the rest is lost due to inefficiencies. A Torqeedo drive converts between 44% and 56% of the available energy into propulsive power, extending range and runtime. A Travel motor can propel a light boat more than 10 nautical miles and only consume the equivalent of 40 g of petrol.

### Horsepower equivalent

Electric motors can achieve the same propulsive power as combustion engines with a significantly lower shaft power because of the different torque curves they produce. Electric motors deliver ample torque, which is available at any rotational speed. This characteristic allows them to turn large, efficient, high-pitch propellers that would cause an equivalent combustion engine to stall at startup. At Torqeedo, we always compare the actual propulsive power of our motors with petrol engines. A Torqeedo motor specified as a "5 HP equivalent" provides the same power as a 5 HP combustion engine, even though its shaft and input power may be lower.





Input power: A performance indicator used for electric motors that doesn't take system losses into account.

**Shaft power:** A power rating used for combustion engines that doesn't take propeller losses into account, which can be anywhere from 20% to 75% of total power.

**Propulsive power:** The performance indicator used by commercial ships and by Torqeedo, which takes all losses into account and indicates actual power delivered.

# **Convenience and value**

What to expect when you switch to electric

### Charging and handling are easy

An electric drive may simplify your onboard routines. Although charging batteries takes time, Torqeedo owners appreciate the simplicity of just plugging in at the end of the day – no need to find a fuel station or carry cans of fuel down the dock. Owners of Travel or Ultralight systems can charge on board via a 12/24 V supply or the Sunfold 50 solar panel, or bring the lightweight, portable lithium battery home to charge it using the mains charger that is supplied. Cruise and Deep Blue-powered boats plug in to shore power and charge overnight. Need a faster turnaround? The high-capacity batteries from these systems can also be equipped with fast chargers or multiple chargers.

Lightweight electric motors are also very easy to handle and store. Our bestselling Travel motors for dinghies, tenders and small sailboats start at just 15.5 kg, including the battery. Motor, battery and tiller also come apart so one piece can be handled at a time. They never leak or stink so your hands and your boat stay clean.

### The economics of electric mobility on the water

In recreational boating today, cleaner and more convenient electric propulsion systems demand a price premium. Depending on the frequency of use, this may be offset by lower operating costs and lower maintenance and winterisation costs. Torqeedo offers full transparency on costs on its website. If you have any questions, please don't hesitate to contact us or your nearest Torqeedo dealer.

In commercial applications, electric mobility is often not only ecologically but also economically superior. Thanks to the substantially lower operating costs, electric propulsion systems often offer a lower total cost of ownership and help commercial operations improve their financial performance. Contact us to find out whether electric mobility will be economical for you.



# Advanced engineering

No other electric boat motor manufacturer boasts such in-depth systems development, as many patents, or as much capacity for innovation as Torqeedo

### **Optimised components**

A high-performance system requires high-performance components. Torqeedo employs in-house industrial engineering for all technologies required for electric mobility. All components are either developed by us or carefully selected to complete our systems.

A poorly designed propeller may only deliver 20% propeller efficiency, yet an outstanding one up to 75%. Torqeedo propellers are perfected over several thousand iterations by the same methods as those used when developing propellers for commercial ships and submarines. But that is not all: the



of Torqeedo's turnover invested in research and development every year a Silicon Valley level.

## **24,000** calculations

per millisecond performed by the processor in the Torqeedo Travel 1103 motor. The computing power significantly improves motor response.

propeller needs to be matched to the motor gear and the requirements of the application, a process known as drive train engineering. When combined with automotive-grade batteries and bespoke electronics and controls, you get superb building blocks for electric propulsion. But it's not a Torqeedo system yet.

We still have to achieve an intelligent interaction between the individual components and create a system that is safe, does its job and delights the user. Only then will we have created a true Torqeedo product. This systems-based approach is at the centre of everything we do.

### Seamless integration

Our software engineers ensure that all the hightech features of Torqeedo's motors, such as realtime range calculations, smartphone integrations, adaptive charging and battery safety protocols, work properly. Coding and testing can account for more than 50% of the development work for today's electric propulsion systems, depending on the system's complexity.

Torgeedo engineers develop data networks that allow different components to communicate with one another quickly and seamlessly. The system constantly exchanges status messages, integrates sensor data and evaluates the appropriate course of action in a matter of milliseconds. Software stops the motor if it senses an impact to the propeller and manages battery charging safely. All Torgeedo motors, even the smallest kayak motors, have a GPS receiver built in that constantly measures speed over ground. With speed data combined with how much power the motor is using, the displays show real-time range and runtime estimates. When linked to a smartphone, the range remaining can even be displayed as a dynamic ring on a map. You never need to worry whether you have enough energy left to get home.



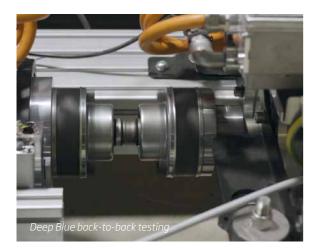
Propeller testing: a well-designed propeller may reach 75% efficiency, a critical step in optimising an electric drive train. 40 lab benches for endurance testing and certifying compliance with international standards located in the German Torqeedo headquarters alone.

### Prepared to drive the future

The most complex Torqeedo systems for large yachts or commercial applications simply wouldn't work without precisely manufactured components and painstakingly programmed software. With these bigger and more complex applications and as the world leader in marine electric drives, it is our responsibility to drive innovation and system development to the next level.

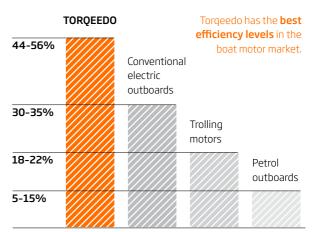
That's why we put so much effort into the development and preproduction process – from planning and design to final testing. Torqeedo's quality management system is ISO 9001-certified with DNV-GL and our 230 international patents for electric boating speak for themselves.





Besides rigorous endurance tests and electromagnetic compatibility testing, Torqeedo has 40 test benches just in our German headquarters outside Munich. These benches perform comprehensive and long-term testing, as well as specific tests for gaining additional productand project-specific approvals, thus achieving or surpassing the highest quality standards in the maritime sector.

BO international and multinational patents held by Torqeedo and covering all components and systems of electric boat motors.



Overall efficiency levels of various outboards

# Clean mobility empowered by cutting-edge foiling tech

Torqeedo technology powers the America's Cup and hydrofoil technology makes electric boats go faster and further than ever before

### Racing sailing revolutionised by hydrofoil technology

Foiling entered the world stage in 2012 with Emirates Team New Zealand's revolutionary AC72 yacht, *Aotearoa*. This "flying" sailboat utilised wing-like hydrofoils attached to the hull, a design which triggered a wave of foiling tech in racing sailing and continues to influence the marine industry as a whole. At first, hydrofoils slightly increase drag but as speed increases, they start to lift the boat out of the water. Once the resistance of the hull moving through the water is reduced, or even eliminated, the boat can go much faster – and needs far less energy. Prior to the use of hydrofoils, the average America's Cup sailing speed hovered around 10 knots. Now it is over 40 knots.



### Torqeedo powers America's Cup foiling cant system

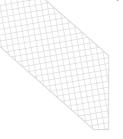
In the 36th America's Cup, a Power 48-5000 battery powers the AC75's foiling cant system, which controls the 40-tonne hydraulic cylinders that position the composite foil arms and wings. While racing, the system controls speed, lift and stability, and ultimately the safety of the yacht and its crew. In 2021, all competing yachts are fitted with the same system. It is a great pleasure for Torqeedo to be working so closely with the engineers and designers responsible for building the most technologically advanced boats on the planet. We will proudly be watching the races in New Zealand, rooting for our respective teams and for Torqeedo.

### From racing sailing to clean motorboats

Building on the experience from cutting-edge racing sailing, foiling technology is progressing quickly and is now available for sustainable motorboating. In combination with lightweight lithium battery technology, foiling electric motorboats can meet most owners' speed and range requirements and will transform recreational and commercial boating over the next few years. It's already happening: 2021 will see the continued success of foiling speedboats and the launch of innovative new electric foiling vessels powered by Torqeedo technology.

The Candela Seven, built by Candela Speed Boats in Sweden, is the world's first 100% electric hydrofoiling motorboat to enter serial production. Powered by a highly customised Deep Blue 50i motor and battery system, the carbon-fibre Candela Seven flies above the waves and water, delivering a quiet, smooth, fast and highly efficient ride.

Every innovation in foiling technology means larger, heavier boats like passenger ferries can partially foil, which increases efficiency and reduces their overall climate impact. At Torqeedo, we are dedicated to supporting the development of foiling technology, advanced hull design, cutting-edge green construction techniques and other developing technologies that will make our on-water experiences eco-friendly, safe and fun for years to come.



Hydrofoils substantially reduce drag compared to even the most efficient hull designs. Passive foils create lift and self-stabilise simply as a function of their shape. In contrast, active foils, like those used in these applications, use sophisticated flight controllers to vary lift and stability by adjusting the foils' angle of attack to the water for ultimate efficiency.





The Ultralight is the easy-to-mount solution for today's fishing kayaks

ADDRESS OF TAXABLE PARTY OF TAXABLE PARTY.

+ Range up to 53 km

Ultralig

- + Weight as low as 8.8 kg
- + Ultra-quiet direct drive (1103 AC)
- Easy to mount on fishing kayaks
- Superb usability with a wealth of smart features

As tested on a fishing kayak ——			
Ultralight 403 AC	Ultralight 1103 A		
8.4 km/h - 2:15 hr	10.0 km/h - 0:50 hr		
6.4 km/h - 7:23 hr	6.4 km/h - 5:44 hr		
3.2km/h-29:30hr	3.2 km/h - 28:36 hr		

11 10



Ultralight mount

### Less fuss, more fish

The Ultralight 403 and 1103 not only take you where the fish are; they deliver hands-free kayak fishing, making them the preferred choice of professional anglers for years now. With a durable, practical and versatile mount for fishing kayaks, the Ultralights allow kayakers to go farther and fish longer, with motors that are **easier to mount, easier to use and faster to store and stow**.

Anglers can choose the motor power that fits their needs, their kayak and their waterways: either the extremely lightweight and efficient Ultralight 403 or the professional-grade, 3 HP-equivalent Ultralight 1103 AC. Both motors come with a mounting system that offers a host of practical features, including easy motor

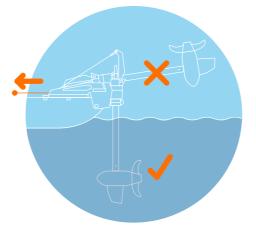
depth adjustment and a lightning-fast way to safely stow the motor for transport (Ultralight 403) or remove it altogether (Ultralight 1103). Simply pull and secure a line to tilt the motor up when fishing in shallow waters or near the shoreline. The reverse lock line allows the motor to be locked down for motoring in reverse (see description below) and then released so the automatic kick-up feature is activated again. Integration with the kayak's steering system is quick and easy, and the onboard computer delivers real-time range and run-time data. Both Ultralights include a magnetic kill switch, which automatically cuts the power if the kayak capsizes.

### Raising, locking and parking the smart way



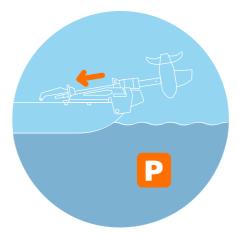
### No problem with obstacles

The mount allows the motor to kick up toward the stern of the kayak when it encounters an underwater obstacle, thus minimising damage.



### **Reversing with one simple action**

Pull the reverse cord and simply hold tension or secure it in the included cleat. Release the cord when moving forward to enable the automatic kick-up feature.



### Handy park position

Safely stowing the Ultralight 403 for transport is quick and easy. Simply pull up and secure with the included elastic cord. To transport the Ultralight 1103, use the quick-release to remove the motor and stow.



### Ultra-powerful. Ultra-efficient. Ultra-stealthy. The Ultralight 1103 AC

Professional kayak anglers don't hit the water without their Ultralight, and neither should you. With the Ultralight 1103 AC, you can beat the crowd and get to that coveted spot more than 30% faster. The whisper-quiet, direct-drive Ultralight 1103 AC comes with the **innovative angler mount** and all the high-tech features you've come to expect: GPS built in, real-time range and runtime display, solar charging, superior safety and performance, and the latest lithium battery technology. The 1103 AC is almost three times more powerful than the Ultralight 403 for the ultimate in acceleration and pulling power, and adds instant throttle response for improved manoeuvrability and a heavy-duty construction with more resistance to impact damage.







Ultralight 1103 AC

Ultralight 403 A/AC

# Mounting, control and charging accessories

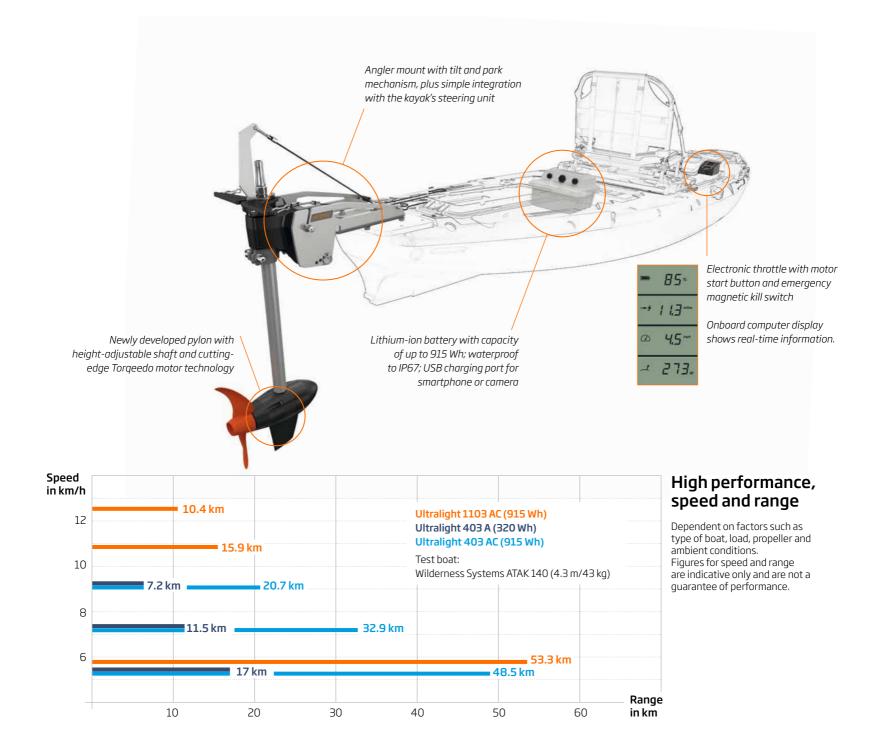
Like all products from Torqeedo, Ultralight motors are offered with a full suite of high-tech accessories. Add a **spare battery** for a quick and simple way to extend range. An optional cable connection with a built-in Bluetooth module transmits all relevant boating and positioning data to the **Torqeedo TorqTrac app**.

A summary of the Ultralight accessories can be found starting on page 50 or online at www.torqeedo.com





These well-known kayak brands have developed custom Ultralight mounts.



# Travel

The whisper-quiet, direct-drive technology of the best-selling Travel 1103 is now available in a lighter, more affordable package: the brand-new Travel 603. These clean and convenient electric outboards make motoring easy and carefree.

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equivalent

Tenders Dinghies Daysailers

Travel 603: boats up to 1 tonne Travel 1103 C: boats up to 1.5 tonnes

DARKING

Lightest outboards in their power class, from 15.5 to 17.3 kg complete
Highest overall efficiency

• Quietest electric outboard

- Most dynamic motor response
- Onboard computer with GPS, remaining range, charge status and additional functions
- Easy handling, fast battery swaps, simple to transport

### As tested on a one-class racing sailboat –

Trave	160	3
IIave	100	-

7.4 km/h - 0:55 hr 4.6 km/h - 2:40 hr 3.5 km/h - 5:20 hr Travel 1103 9.0 km/h - 0:55 hr 5.8 km/h - 3:03 hr 3.5 km/h - 9:10 hr

As tested on a small inflatable			
Travel 603	Travel 1103		
7.1 km/h - 0:55 hr	9.3 km/h - 0:50 hr		
5.6 km/h - 1:45 hr	6.9 km/h - 2:17 hr		
3 3 km/h - 5:20 hr	39 km/h - 9.10 hr		

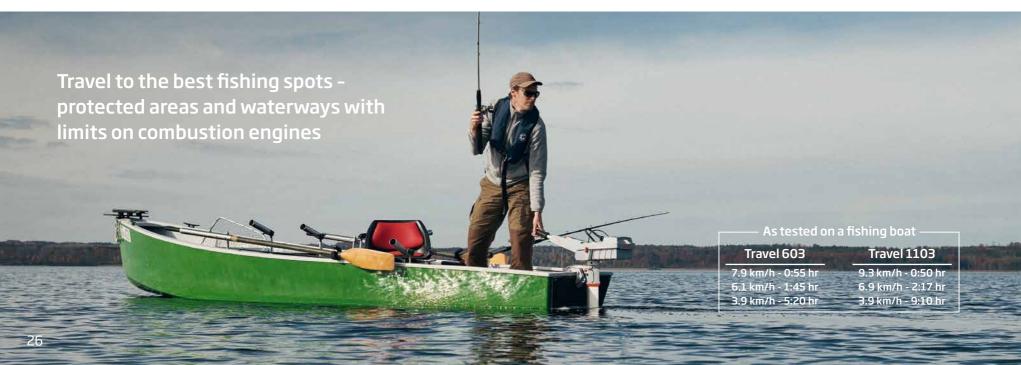
# The freedom to Travel powerfully, efficiently and quietly

Travel motors have been delighting boaters with their outstanding efficiency, useful technology and easy-touse design for more than 15 years. The Travel 1103 and Travel 603 motors are the lightest, quietest outboards in their respective power classes and come with a highperformance lithium-ion battery and a built-in onboard computer with GPS, remaining range and charge status - everything you need to know at a glance. Travel motors boast a durable direct-drive motor, industrially engineered to provide superior efficiency and the most dynamic motor response. The Travel 1103 comes with a high-capacity 915 Wh battery but is still easy to handle at just 17.3 kg complete. Racing yachts and other weight-sensitive applications may prefer the Travel 603 at just 15.5 kg, complete. Its 500 Wh, 4.2 kg battery even floats!



Travel 603

Travel 1103 C



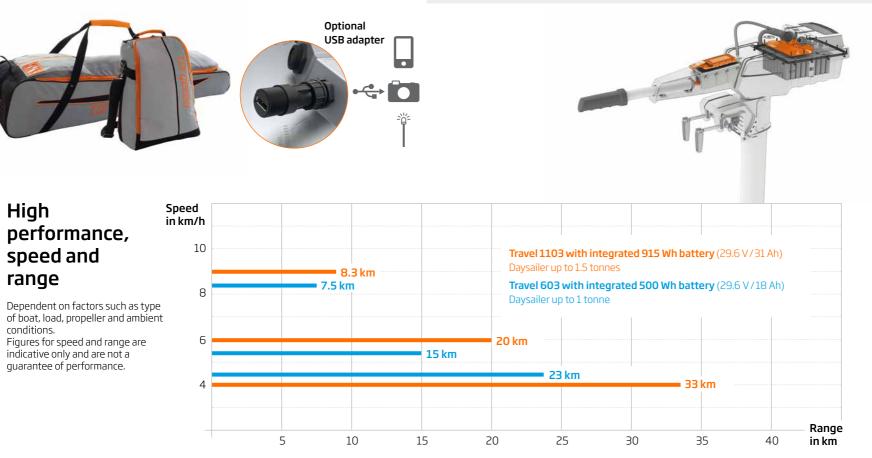
### **Motor accessories**

Like all products from Torqeedo, Travel motors are offered with a full suite of high-tech accessories. It's easy to add **a spare battery or a remote throttle** for operating the motor from the helm instead of the tiller, or choose the **TorqTrac smartphone app**. With the optional Bluetooth dongle installed, TorqTrac turns your compatible smartphone into a bright, easyto-read onboard computer with a number of useful motor and battery readouts. The app is available from the App Store (iOS) or Google Play Store (Android).

The convenient Travel bag set protects the motor, tiller and accessories and includes a separate, easy-to-carry battery bag. Further details can be found online at www.torqeedo.com or on page 50.

# What's inside your battery (and why it matters)

Battery cell type might be the most important factor when selecting an electric outboard. Travel batteries use high-quality, individually welded, cylindrical steel safety cells equipped with multiple safety mechanisms made by the world's most reputable manufacturers. The battery is further protected with a built-in battery management system with redundant hardware backups for every safety-relevant function. Other cell types, such as inexpensive pouch cells, are susceptible to damage from heat, vibration and the repeated shocks common on boats. Consumer-grade pouch cells also offer less effective protection against short-circuiting and have a shorter overall service life.



# **Cruise outboards**

Proven, reliable motors with upgraded lithium batteries are the ultimate power packs for sailing or motorboats.

- + Minimum weight with maximum performance
- + Onboard computer with GPS
- Durable and extremely robust design
- Effective corrosion protection for fresh and salt water
- Extended range thanks to very high energy density batteries





Motorboats, dinghies, sailboats, water taxis, passenger ferries and commercial applications up to 10 tonnes

8

### As tested on a small inflatable -

Cruise 4.0 R	
18.3 km/h - 1:20 hr	

8.2 km/h - 4:50 hr 5.9 km/h - 7:00 hr

with 1 x Power 48-5000

Cruise 10.0 R 29 km/h - 0:55 hr 9.5 km/h - 3:30 hr 5.8 km/h - 10:00 hr with 2 x Power 48-5000

### - As tested on a small runabout -

Cruise 4.0 R	Cruise 10.0 R
10.4 km/h - 1:20 hr	23.0 km/h - 1:00 hr
7.2 km/h - 5:40 hr	15.5 km/h - 2:40 hr
5.4 km/h - 12:00 hr	7.8 km/h - 11:00 hr
with 1 x Power 48-5000	with 2 x Power 48-5000

8

### Fuel-free, durable, and perfectly integrated



Since their premiere in 2006, Cruise motors have been delighting users with power requirements between 5 and 20 HP equivalents. The outboard motor of choice for motorboats, dinghies and commercial users the two smaller units (below left, 5 HP/8 HP equivalents) come with a choice of a tiller or an electronic throttle lever and can be fitted quickly and easily with minimal tools. Cruise motors have a **built-in GPS with on-board computer and display** of information such as speed and input power, state of charge and remaining range, even with third-party batteries. They have a **robust, wear-resistant**  **design** thanks to features such as a housing that is waterproof to IP67, pylons made from marine-grade aluminium and a specially reinforced fin. They team up with the purpose-developed propellers and additional Torqeedo components to create a highly impressive package.

The flagship remote outboard model in the Cruise series (20 HP equivalent) received a technical update for the 2021 boating season. A new standard feature is Torqeedo's advanced communication system, **TorqLink**, which allows faster and more accurate data sharing between system components.



Cruise 2.0/4.0 T

Cruise 2.0/4.0 R

Cruise 10.0 T

Cruise 10.0 R

### Motor accessories

Like all products from Torqeedo, the Cruise motors combine perfectly with the safest lithium batteries on the market today (see page 38) and a choice of **propellers** that deliver either more thrust or more top-end speed. **Premium throttles**, which come with built-in **Bluetooth** for easy integration with the **TorqTrac app**, are another standout accessory for the Cruise lineup.

The Torqeedo throttle controls are available for either side or top mounting. More information can be found on page 50 or online at www.torqeedo.com.

# New for **2021**



More information on page 35

### <sup>9</sup>Introducing TorqLink

TorqLink is Torqeedo's advanced electronics communication system developed for Deep Blue and now available for select Cruise motors, throttles and Power 48-5000 batteries. All products marked TorqLink will communicate seamlessly at startup. A TorqLink Gateway (2217-00) allows you to include components without TorqLink in your system.



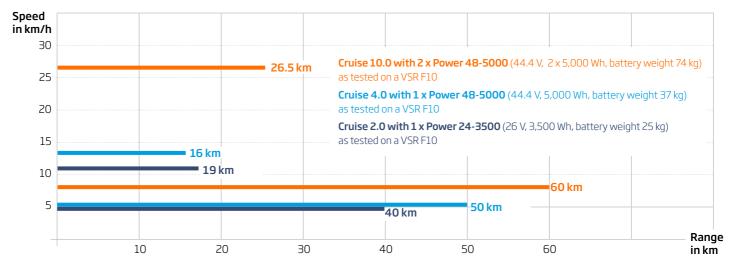
Side-mount motor and display

### High performance, speed and range

Dependent on factors such as type of boat, load, propeller and ambient conditions. Figures for speed and range are indicative only and are not a guarantee of performance.



Top-mount single



# Cruise pod drives

Quiet and eco-friendly, lightweight Cruise pods free up space below deck and can charge their own batteries while under sail.

Scan me

Sailboats up to 10 tonnes Commercial application up to 10 tonnes

- + Smaller and lighter than combustion saildrives
- + Virtually silent while in use
- + No fuel or oil to leak or stink
- + Powerful lithium batteries provide long-range motoring
- + Minimal impact on sailing speed
- + Durable design and excellent corrosion protection for fresh and salt water

### As tested on a daysailer

Crui	ico	2 (	) E	D
Ciu	DE	<b>_</b> V		

8.5 km/h - 1:45 hr 6.0 km/h - 3:30 hr 4.0 km/h - 7:00 hr

with 1 x

Power 24-3500

11.3 km/h - 1:10 hr 7.6 km/h - 5:20 hr 5.6 km/h - 15:00 hr with 1 x

Cruise 4.0 FP

Power 48-5000

33

### Long-lasting, robust and efficient

For sailboats up to 10 tonnes the advantages of electric pod motors are stunningly clear. Beautifully quiet and clean-running, Cruise pods deliver highly impressive performance and long range when paired with Torqeedo's lightweight lithium batteries (see page 38) and take up minimal space below deck.

The built-in GPS, onboard computer and display take all motor, battery and charging data into account and display them clearly, providing a perfectly harmonised drive system.

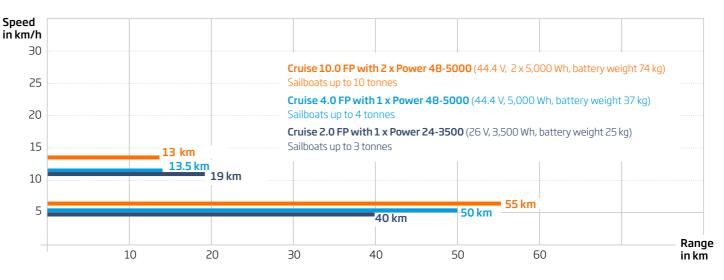
The flagship fixed pod model in the Cruise series (20 HP equivalent) received a technical refresh for the 2021 boating season. It now comes standard with Torqeedo's advanced communication system, TorqLink, which allows faster and more accurate data sharing between system components.



# Introducing TorqLinkImage: State of the state of

### High performance, speed and range

Dependent on factors such as type of boat, load, propeller and ambient conditions. Figures for speed and range are indicative only and are not a guarantee of performance.



### New TorqLink throttle with colour display

With its bright, easy-to-read colour display, this new throttle is the perfect control for your TorqLink-equipped Cruise 10.0 system. It displays all critical system data at the push of a button and boasts infinitely variable forward and reverse in a high-tech design. And it has Bluetooth built in for easy connection with TorqTrac, the Torqeedo smartphone app.





Drive screen: Speed over ground



Range screen: Energy efficiency and runtime

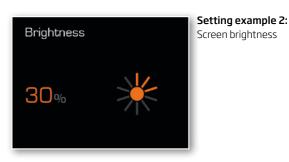


Setting example 1: Hydrogeneration on/off



Power screen: Energy consumption





# Superior battery technology

Safe, powerful and easy to use, Power batteries are the ultimate energy source for Cruise motors or hotel loads

Lithium-based batteries are the technology of choice for electric mobility applications. They store significantly more energy than all other batteries, maintain a high current (a major advantage for electric drive systems), do not lose their charging capacity, supply power reliably even in cold weather and have no memory effect. They also provide many more cycles than lead-based batteries. Torqeedo has been a pioneer in the development of lithium batteries for marine applications for more than a decade. Since we make our batteries just a little bit better each year, we offer the most comprehensive and integrated protection and safety concept for lithium batteries on the market – coupled with performance and convenience.

### Intelligent battery management system (BMS)

The BMS **monitors and protects** Torqeedo batteries against overcharging, overcurrent, deep discharge, short-circuiting and overheating. The battery has comprehensive safety features, and each safety-relevant component is duplicated with a backup component should it fail. In addition to these safety features, the BMS safeguards the battery's life expectancy with balancing and deep-sleep functionality.

### Safe and easy to transport

Thanks to their **high energy density**, the volume and weight of lithium batteries are more than 70% lower than comparable AGM or lead-gel batteries. This makes our low-voltage batteries simple to handle and light to carry. On top of that, Torqeedo Power and Deep Blue batteries can be switched on and off, allowing them to be safely **transported and installed** and protecting them against unintentional discharge.

POWER 48



#### High-quality safety cells

Several hardware mechanisms in every single cell provide additional safety. Torqeedo only uses cells based on lithium (Li-NMC) sourced from the **clean, precision production processes** of reputable manufacturers. In the case of the Power 48-5000, the modules are produced by BMW i.

#### System communications

The battery electronics continuously communicates all the details of the battery status to the onboard computer.

#### **Completely waterproof**

Waterproof housing (IP67): While battery immersion should be avoided, all Torqeedo batteries are, without exception, completely waterproof. The waterproof characteristics of each battery are individually tested prior to delivery. Waterproof connections: Whether connected or not, all cable

connectors are completely waterproof to IP67.

### Safety of lithium batteries

Besides performance, safety plays an important role for lithium batteries. In our view, five factors need to be considered in order to ensure that safe really means safe:

- 1. **Safe battery chemical engineering**, such as Li-NMC (lithium nickel manganese cobalt oxide).
- Safe cell packaging: Torqeedo only uses individually welded safety cells – either steel cylindrical or assembled into modules and equipped with multiple safety mechanisms. Other forms of packaging offer a lower standard of safety as they afford less effective protection against short-circuiting within the cells.
- Clean, precision production processes on the part of the cell manufacturers: Torqeedo only uses cells and modules sourced from the world's most reputable brands.
- 4. Battery management system (BMS) with redundant safety features: Unlike lead-based batteries, lithium batteries always need a BMS to perform balancing and safety functions. If any electronic components of the BMS fail, it may itself become a safety risk for the battery. That's why there is hardware backup for all safety-relevant components in Torqeedo batteries. Incidentally, this is also stipulated in the automotive and aerospace industries and for medical technology.
- Waterproof to IP67: Water in lithium batteries can lead to various problems, such as corrosion of the BMS hardware or generation of electrolytic gas. Lithium batteries on board a boat should therefore be waterproof.

## **Power play**

The 24 V Power 24-3500 delivers 3.5 kWh of power in just 25.3 kg for an impressive energy density of 138 Wh/kg. With the 1,700 W fast charger, you can fill up the Power 24-3500 in just under two hours, making this lithium pack perfect for the Cruise 2.0 motor or powering hotel loads on board. For boats powered by Cruise 4.0 or 10.0 motors, choose the 48 V Power 48-5000 with TorqLink.

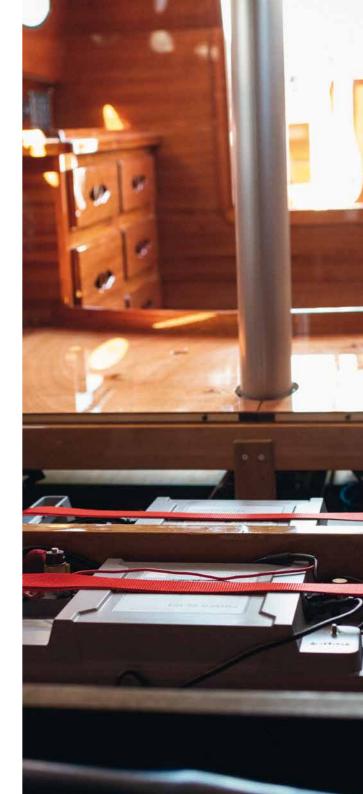








	Power 48-5000	Power 24-3500	
Useable energy	5,000 Wh	3,500 Wh	
Nominal voltage	44.4 V	25.9 V	
Weight	37.0 kg	25.3 kg	
Energy density (weight)	135 Wh/kg	138 Wh/kg	
Maximum discharge rate	200 A (8,880 W at nominal voltage)	180 A (4,500 W at nominal voltage)	
Dimensions	506 x 386 x 224 mm	577.5 x 218.5 x 253.5 mm	
Battery chemistry	Li NMC	Li NMC	
Cycle lifetime	> 3,000 cycles at 80% depth of discharge at 25°C results in approx. 20% capacity loss	800 cycles at 100% depth of discharge at 25 °C results in approx. 25% capacity loss	
Annual capacity loss	<3%	<4%	
Max. connections	2P as shipped; contact us for more options	258P or 1516P	
TorqLink	Yes	No	
Price-performance	1 EUR/Wh	0.86 EUR/Wh	



# Head for the horizon with Cruise Hybrid

Cruise Hybrid systems provide economical, complete power for your 25- to 40-foot vessel up to 10 tonnes. Tried-and-tested Cruise motors are matched with high-performance lithium-ion batteries from Torqeedo's Power series, a variety of charging options and electronic throttles and displays – all connected with TorqLink, Torqeedo's advanced communications protocol. Choose to view system data on your boat's NMEA 2000 multifunctional display, throttle display or directly on your smartphone with the TorqTrac app.

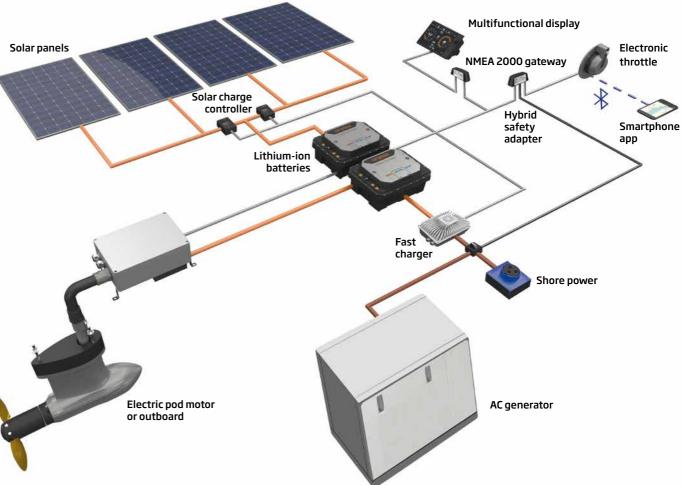
Charge your batteries from shore power with our standard or fast chargers, or harness the power of

the sun with a smart solar charge controller and your onboard photovoltaics. Sailboats can even charge their own batteries while sailing by simply placing the system in hydrogeneration mode. For seamless backup power you can integrate AC digital inverter generators up to 10 kW – just visit torqeedo.com for technical details.

# New for **2021**

# Solar charge controller for Power 48-5000

This smart solar charge controller keeps your Cruise with TorqLink and Power batteries system charged via free, green solar energy. The integrated MPPT maximises the energy yield of the solar modules during charging and eliminates passive losses by turning on the battery for charging only when solar power is available. Large solar arrays are now easy to integrate – simply connect up to six solar charge controllers in parallel with a peak input power of 325 W each.



# **Deep Blue**

The only complete solution for powerful electric drive systems available on the market today - a fully integrated propulsion and energy management system.

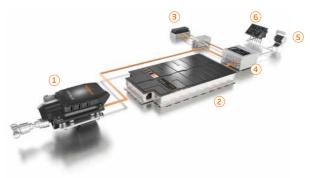


Yachts up to 120 feet Large motorboats Boats in nature reserves Boats for commercial use, e.g. water taxis, ferries and tour boats

- Deep Blue is the electric drive system of choice for the world's most reputable boat brands
- Motors up to 100 kW are available in a high-RPM version for planing boats and low RPM for displacement vessels
- Upgraded 40 kWh batteries deliver the latest in automotive technology adapted for marine use
- Sets industry standards for production quality and safety systems
- Clean, renewable energy generation with automatic generator backup

# The modular, scalable, single-source solution

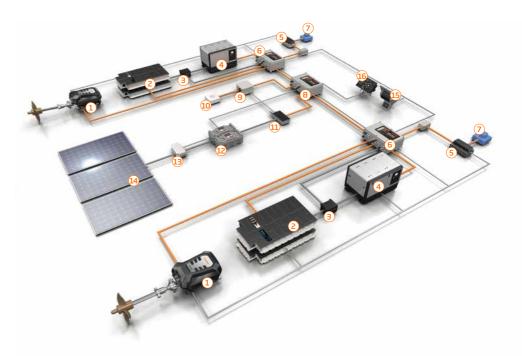
More than just a battery-powered electric motor, Deep Blue is a fully integrated propulsion and energy management system – customisable with modular components and industrially engineered to meet the highest demands. The result is exceptional performance and safety, compliance with international standards at the system level and highly intuitive operation. This single-source turnkey solution is available as an outboard, inboard or saildrive for recreational boats and commercial applications.



#### Deep Blue system

The essential Deep Blue configuration is suitable for vessels with access to shore charging and a priority on propulsive power. The system components, from propeller to high-tech user interface, are perfectly matched and integrated to provide emission-free, quiet and powerful propulsion.

- 1 Powerful electric motor
- 2 360 V high-capacity lithium battery system
- 3 Shore power chargers
- 4 System management unit
- 5 Electronic throttle
- 6 Display with onboard computer



#### **Deep Blue Hybrid system**

This integrated, modular system is suitable for larger vessels, oceangoing yachts or commercial vessels with complex onboard energy requirements. Deep Blue Hybrid provides comprehensive energy management. Each component's energy demands are monitored and managed by the central system, ensuring economical collection and distribution of clean, renewable energy with automatic generator backup when necessary.

- 1 Powerful electric motor
- 2 360 V high-capacity lithium battery system
- 3 12 V batteries
- 4 Efficient state-of-the-art diesel generator
- 5 Shore power chargers
- 6 System management unit
- 7 Shore power connection
- 8 System connection box
- 9 AC inverter

- 10 Isolated AC power system
  - (120/240 V AC current, 50/60 Hz)
- 11 Bi-directional DC/DC converter
- 12 24 V on-board batteries
- 13 Solar charge controller
- 14 Photovoltaic modules
- 15 Electronic throttle
- 16 Display with onboard computer

# Always in control

Deep Blue offers intuitive operation presented on the multifunctional display, providing a complete overview of the entire system and access to all control functions. The software keeps an eye on everything and prevents issues like deep-discharging batteries. An easy-to-understand graphical user interface is available as either multihull or monohull and delivers complete, up-tothe-minute system visualisation.



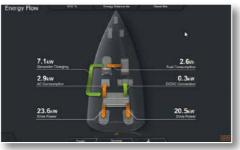
Main menu: Navigate easily between different categories.



**Drive screen:** All important information needed while motoring. You can choose to display or hide the information line at the top.



**System management:** Provides status data on all system components. Select individual components for more detail.



**Energy flow:** Understand your system's power balance and energy flow at a glance.





### **Deep Blue for sailboats**

When designing a new sailing yacht or contemplating a refit, each component must be evaluated to be sure it does its job, works well with the rest of the onboard systems and provides the best possible user experience. Deep Blue and Deep Blue Hybrid, with powerful electric motors available up to 100 kW, make yachting more convenient and more environmentally friendly, while reducing dependence on shore supplies through onboard generation of clean, renewable power. Add in worldwide service, a 9-year limited battery warranty and the peace of mind that comes with choosing the world leader in electric mobility on the water and this choice couldn't be clearer.

New for



recr	inicai	uata	

Inboards	Deep Blue 25 i 1400	Deep Blue 50 i 1400	Deep Blue 100 i 900
Max. propeller speed	1,400 rpm	1,400 rpm	900 rpm
Shaft power (continuous)	25 kW	50 kW	100 kW
Shaft power (peak)	30 kW	60 kW	-
Torque	343 Nm	350 Nm	1060 Nm
Weight (incl. electronics)	85 kg	85 kg	465 kg

Saildrive	Deep Blue 25 SD	Deep Blue 50 SD
Max. propeller speed	1,360 rpm	1,200 rpm
Shaft power (continuous)	25 kW	50 kW
Shaft power (peak)	30 kW	55 kW
Torque	180 Nm	400 Nm
Weight (incl. electronics)	125 kg	162 kg

#### Deep Blue 50/100 SD

Torgeedo now offers a new power range of electric saildrives, integrating the proven drive train technology of Deep Blue with saildrive legs from ZF. The quiet, emission-free fixed saildrives are reliable components for environmentally friendly bluewater sailing. Both saildrives are designed for sailing speeds up to 30 knots for high-performance sailing and efficient hydrogeneration, keeping your system charged while under sail. Deep Blue 50 SD easily mounts on Yanmar engine beds. Deep Blue 100 SD is a custom integration contact us during your design-in phase.

## **Deep Blue for motorboats**

The first and only high-power electric drive system for motorboats from industrial production, Deep Blue offers exceptional performance, professional safety and easy operation. Motorboats and fast yacht tenders can choose from our high-tech outboard and inboard drives paired with high-capacity lithium batteries. The 40 kWh



battery is the ultimate standalone energy source. With a 9-year limited battery capacity warranty, outstanding efficiency and a proven long service life, Deep Blue is the exclusive solution for powerful electric motorboats.







Deep Blue 25/50 R Deep Blue 25/50 i

Deep Blue 100 i 2500

#### **Technical data**

Outboards	Deep Blue 25 R	Deep Blue 50 R
Max. propeller speed	2,400 rpm	2,400 rpm
Shaft power (continuous)	25 kW	50 kW
Shaft power (peak)	30 kW	60 kW
Torque	198 Nm	198 Nm
Weight (incl. electronics)	from 139 kg	from 139 kg

Inboards	Deep Blue 25 i 1800	Deep Blue 50 i 1800	Deep Blue 100 i 2500
Max. propeller speed	1,800 rpm	1,800 rpm	2,700 rpm
Shaft power (continuous)	25 kW	50 kW	100 kW
Shaft power (peak)	30 kW	60 kW	120 kW
Torque	280 Nm	280 Nm	437 Nm
Weight (incl. electronics)	85 kg	85kg	195 kg

#### Deep Blue 100i 2500

This 100 kW motor was specifically constructed to power fast, planing motorboats. With a reliable, lowmaintenance, direct-drive design, the Deep Blue 100 i delivers extraordinary performance, with up to 2,700 RPM and a torque of 437 Nm.





# The power of Deep Blue: High-capacity lithium batteries with technology by BMW i

Industry-leading energy density, the latest automotive technology and highest safety standards

BMW i high-capacity batteries are available for boats. This technology, proven in thousands of BMW's innovative i3 automobiles, has been integrated into the Deep Blue system by Torgeedo.

#### The latest generation of automotive battery cells:

- Very high energy density
- Prismatic cell design allows efficient cooling, a compact form, even temperature distribution within the battery and an extremely rugged structure
- Robust protective aluminium housing with safety vent
- From the automated production process of Samsung SDI, a leading manufacturer of lithium battery cells

#### Laser-welded cell connections: Over a larger surface and therefore stronger and more powerful than conventional spot-welded cell connections.



**Pressure safety disc:** The battery is waterproof to IP67. In the unlikely event of excess pressure developing in a cell, the prismatic cells will release the excess pressure through a valve. This is a significant safety advantage over foil-welded cells and pouch cells. The pressure safety disc allows gases to escape and ensures the battery stays waterproof in normal operation.



#### Automated module production:

- Prismatic cells have many advantages. However, they must be assembled extremely accurately in a very robust frame for a long service life. Otherwise, charging and discharging would, over time, lead to the cells expanding and collapsing very slightly and cause them to age prematurely.
- The fully automated module production at BMW in Dingolfing has set the standard in high-precision and extremely robust battery modules.
- The very rugged design is ideal for boat applications that place high demands on shock resistance.

## Battery management system (BMS) at module and battery levels:

- State-of-the-art BMS technology
- Developed to ASIL C standards as used in the automotive industry for maximum safety
- Qualification and acceptance testing at a far higher level than is typical in the boating industry

**Compressor cooling:** Cools the battery to ensure high performance and a long service life, even in high ambient and water temperatures – in all climate zones anywhere in the world.

Power and data connections from the battery to the Deep Blue system

### **Professional safety standards**



The **insulation monitor** constantly monitors that the voltage from all 360 V components is completely isolated from the boat – not just for individual system components but for all of them. If damage is detected, e.g. to the cable insulation, the system will issue an alert. In the event of dangerous insulation failure, the system will be shut down.



The **pilot line** monitors all 360 V cable connections on the Deep Blue. It will shut off the system immediately if it detects exposed highvoltage contacts in order to avoid any risk. Pilot lines have been mandatory for high-voltage equipment in other industries. They are not typically found in high-voltage, made-to-order boat drives.



#### Automotive industry-level battery safety:

The first lithium batteries for the marine industry with the advanced quality standards of the automotive sector are the result of Torqeedo's collaboration with established battery manufacturers. Integrating a battery into a drive system and the associated safety concept alone requires considerable effort that can only be achieved by working together with the battery manufacturer.



Battery venting: In the unlikely event that the redundant safety mechanisms of the battery fail, the battery cells can reduce their temperature and pressure via a pressure valve. While batteries are installed in electric cars in such a way that they can discharge battery gases directly onto the road, on electric boats the gases must be channelled safely off the vessel. We developed the first safe venting system for boats for the Deep Blue system.



All components are waterproof: Components that were not specifically developed for boats are not always waterproof. All the components of a high-power system on a boat must be waterproof to guarantee safe operation. That is why all of our components are waterproofed and, in some cases, are further protected by water sensors.



Battery damping: All components on fast and seagoing boats are subject to constant high levels of shock that exceed shock levels on the road - in some cases over 12 g of acceleration force. The same holds true when trailering the boat. Since batteries and battery electronics are not designed for these constant impacts, they need their own damping system on boats (in addition to the damping mechanisms within the battery). Torqeedo is the only company in the world that provides this for maritime use.

## The perfect powerhouse



#### **Deep Blue battery**

The latest battery technology from the BMW i3 series: high energy density, long service life, robust and built to the highest standards of quality and safety.

With 40 kWh of usable capacity, the Deep Blue battery provides plenty of power for a full day on the water and paves the way for all sorts of new Deep Blue applications.

#### Technical data - Deep Blue battery

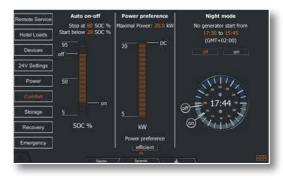
Nominal voltage	360 V
Max. continuous performance	55 kW
Capacity	40 kWh
Weight	278 kg
Dimensions	1660 x 964 x 174 mm

## Integrate a range extender

#### Automatic and efficient backup power

Deep Blue makes it easy to manage your range extender for seamless backup power. AC generators up to 60 kW can be integrated into your Deep Blue energy management system or ultra-efficient DC generator input managed via the new DC interface for maximum comfort, convenience and safety. Check on your energy balance at a glance, set charging parameters, maintain state of charge or explore ultra-convenient options like Night Mode, which ensures batteries are fully charged by the time you specify. This allows you to enjoy all the comforts of your yacht at night without the noise and fumes of a running generator.

#### **Deep Blue DC interface**



# Accessories

From bag sets to batteries, enhance your boating experience with Torqeedo accessories.

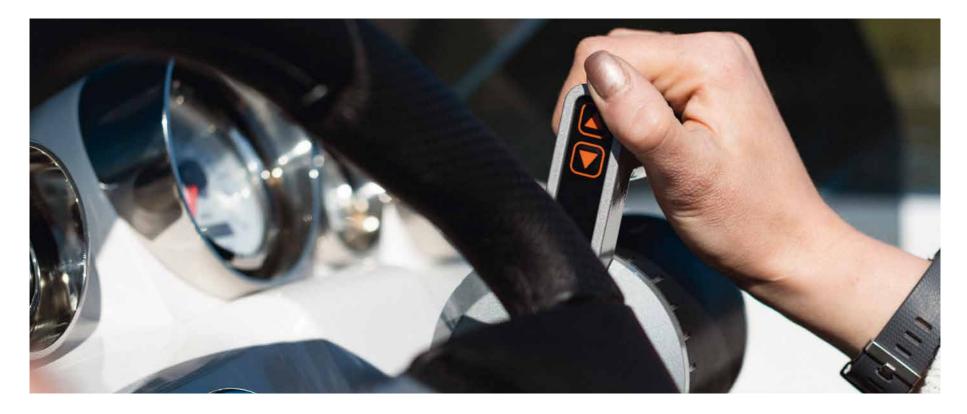
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- + Add a spare battery for additional range
- Charge via solar, 12 or 24 V onboard supply or plug in to shore power
- Upgrade to a practical, ergonomic and Bluetooth-equipped throttle
- Efficient propellers for high speed or more thrust

PPDD

The full range of Torqeedo accessories is available at www.torqeedo.com

TOPOREDO



## **Controls and data integration**



Premium throttles (top-mount twin as shown here)

Our premium throttles offer the right solution for every application, whether for sailboats or on motorboats – ergonomic, strong and functional. All premium throttles come with Bluetooth built in for simple integration of Torqeedo's TorqTrac smartphone app.



#### **Remote throttle**

Instead of using the tiller, you can control your Travel or Cruise motor with the throttle located 1.5 or 5 metres away. This remote throttle comes with an onboard computer display, fully variable forward and reverse, and two different lengths of data cable.



#### NMEA 2000 gateway set

Link external devices to Torqeedo drive systems with TorqLink. The small gateway plugs in quickly and easily, and allows NMEA-2000 devices to access and display key motor and battery information.



## **Power supply**



#### **Spare Ultralight batteries**

Extend your range with a second battery on board. Available in 320 Wh or 915 Wh capacity.



#### **Spare Travel batteries**

Extend your range with a second battery on board. Available in 500 Wh or 915 Wh capacity.



#### Power 24-3500

This 25 kg 24 V lithium pack is perfect for the Cruise 2.0 motor or powering hotel loads on board.



#### Power 48-5000

For boats powered by Cruise 4.0 or 10.0 motors, choose the 48 V Power 48-5000. Now with TorqLink, fast charging and solar charging.







This lightweight solar panel delivers lots of clean solar energy and can be easily folded for storage. Suitable for all Travel and Ultralight batteries from 2015.



#### Solar charge controllers

The integrated MPPT controls solar charging, maximising energy yield and overall efficiency for systems with Power batteries.



#### **Fast chargers**

Specifically developed for Power batteries, these fast chargers can fully charge a single battery in approximately two hours at 240 V.



#### USB adapter for Travel and Ultralight batteries

Charges small equipment such as smartphones, cameras or onboard lights.



## **Propellers**



#### Spare propeller

Choose a spare standard prop or a version with higher top-end speed or more thrust at low RPM.



## Folding propellers for Cruise 2.0/4.0/10.0 FP

Low drag when under sail, powerful propulsion while motoring.

You can find more information about all our accessories and a detailed propeller guide on our website:

## www.torqeedo.com

#### Technical data

## Outboards and pods ≤ 20 HP equivalent

	ULTRALIGHT 403 A/AC	ULTRALIGHT 1103 AC	TRAVEL 603	TRAVEL 1103 C
Input power in W	400	1,100	600	1,100
Propulsive power in W	180	540	295	540
Comparable petrol outboard (shaft power)	1 HP	3 HP	2 HP	3 HP
Comparable petrol outboard (thrust)	2 HP	4 HP	2 HP	4 HP
Comparable diesel inboard (shaft power)			-	
Comparable diesel inboard (thrust)		-	-	-
Maximum overall efficiency in %	45	49	49	49
Static thrust in Ibs*	33	70	44	70
Integrated battery (Li-Ion)	320 (A) / 915 (AC) Wh	915 Wh	500 Wh, floating	915 Wh
Nominal voltage in V	29.6	29.6	29.6	29.6
Final charging voltage in V	33.6	33.6	33.6	33.6
Total weight in kg	8.8 (A) / 11.0 (AC)	15.3	15.5	17.3 (S) / 17.7 (L)
Motor weight without battery, in kg	5.0	9.3	11.3	11.3 (S) / 11.7 (L)
Weight of integrated battery, in kg	3.8 (A) / 6.0 (AC)	6.0	4.2	6.0
Shaft length in cm	48	51	62.5	62.5 (S) / 75 (L)
Standard propeller (v = speed in km/h at p = power in W)	v10/p350	v10/p1100 weedless	v10/p1100	v10/p1100
Alternative propeller options	-	-	v10/p1100 weedless	v10/p1100 weedless
Maximum propeller speed in rpm at full load	1,200	1,450	- 1,100	1,450
Control	Throttle	Throttle	Tiller	Tiller
TorqLink	No	No	No	No
Steering	Connects to kayak steering, lockable	Connects to kayak steering, lockable	+/-60° lockable	+/-60° lockable
Tilting device	Manual, with impact protection	Manual, with impact protection	Manual, with impact protection	Manual, with impact protection
Trim device	Manual, 4-step	Manual, 4-step	Manual, 4-step	Manual, 4-step
Stepless forward/reverse drive	Yes	Yes	Yes	Yes
Integrated onboard computer with display	Yes	Yes	Yes	Yes

\* Torqeedo static thrust measurement is based on internationally accepted ISO standards. Static thrust figures for conventional trolling motors are typically measured differently, which results in higher values. To compare Torqeedo static thrust data with conventional trolling motors, add approximately 50% to the Torqeedo static thrust values.

\*\* not included

CRUISE 2.0 T/R	CRUISE 4.0 T/R	CRUISE 10.0 T/R	CRUISE 2.0 FP	CRUISE 4.0 FP	CRUISE 10.0 FP
2,000	4,000	10,000	2,000	4,000	10,000
1,120	2,240	5,600	1,120	2,240	5,600
5 HP	8 HP	20 HP	-	-	-
6 HP	9.9 HP	25 HP	-	-	-
-	-	-	5 HP	8 HP	20 HP
-	-	-	6 HP	9.9 HP	25 HP
56	56	56	56	56	56
115	189	up to 405	115	189	up to 435
-			-	-	-
24	48	48	24	48	48
-	-	-	-	-	-
T: 17.5 (S) / 18.6 (L) R: 15.3 (S) / 16.2 (L)	T: 18.3 (S) / 19.4 (L) R: 16.1 (S) / 17.0 (L)	T: 60.3 (S)/61.8 (L)/63.0 (XL) R: 59.8 (S)/61.3 (L)/62.5 (XL)	15.4	15.8	33.5
-	-	-	-	-	-
-	-	-	-	-	-
62.4 (S) / 74.6 (L)	62.4 (S) / 74.6 (L)	38.5 (S)/51.2 (L)/63.9 (XL)	-	-	-
v13/p4000	v20/p4000	v22/p10k	v13/p4000	v13/p4000	v15/p10k
v19/p4000 v20/p4000 v30/p4000	v13/p4000 v19/p4000 v30/p4000	v32/p10k v15/p10k	v13/p4000 (folding propeller)	v13/p4000 (folding propeller)	v15/p10k (fold. prop. v22/p10k v32/p10k
1,300	1,300	1,400	1,300	1,300	1,400
Tiller/throttle standard	Tiller/throttle standard	Standard (T)/TorqLink throttle (R)**	Throttle standard	Throttle standard	TorqLink throttle**
No	No	No (T) / Yes (R)	No	No	Yes
360° lockable	360° lockable	+/-45°	-	-	-
Manual, with impact protection	Manual, with mpact protection	Power tilt		-	-
Manual, 4-step	Manual, 4-step	Manual, 4-step	-	-	
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes

(S) short version(L) long version

(XL) extra-long version

### Ordering information

Part No.	Product	Description	Part No.	Product	Description
			1235-00	Cruise 2.0 TL	As part No. 1234-00, but with long shaft
Ultralig			1236-00	Cruise 4.0 TS	High-efficiency outboard, 8-9.9 HP equivalent, with tiller steering, integrated onboard computer with GPS-based range calculation, 25 mm <sup>2</sup> cable set (3 m) including fuse, main switch and v20/p4000 propeller, short shaft version
1405-00	Ultralight 403 A	Ultralight outboard, 1 HP equivalent, with 320 Wh high-per-	1237-00	Cruise 4.0 TL	As part No. 1236-00, but with long shaft
		formance lithium battery, including charger, throttle, onboard computer, GPS-based range calculation and emergency magnetic kill switch	1230-00	Cruise 2.0 RS	High-efficiency outboard, 5-6 HP equivalent, including connection to remote steering, throttle, integrated onboard computer with GPS-based range calculation, 25 mm <sup>2</sup> cable
1407-00	Ultralight 403 AC	Ultralight outboard, 1 HP equivalent, with 915 Wh high-per- formance lithium battery, including charger, throttle, onboard computer, GPS-based range calculation and emergency			set (3 m) including fuse, main switch and v13/p4000 propel- ler, short shaft version
		magnetic kill switch	1231-00	Cruise 2.0 RL	As part No. 1230-00, but with long shaft
1408-00	Ultralight 1103 AC	Ultralight outboard, 3 HP equivalent, with 915 Wh high-perfor- mance lithium battery, including charger, throttle, onboard computer, GPS-based range calculation and emergency magnetic kill switch	1232-00	Cruise 4.0 RS	High-efficiency outboard, 8-9.9 HP equivalent, including connection to remote steering, throttle, integrated onboard computer with GPS-based range calculation, 25 mm <sup>2</sup> cable set (3 m) including fuse, main switch and v20/p4000 propeller, short shaft version
1410-00	Spare battery Ultralight 403 (A),	High-performance lithium battery with integrated GPS receiv- er, 320 Wh, 29.6 V, 11 Ah. For all Ultralight models (1404-00,	1233-00	Cruise 4.0 RL	As part No. 1232-00, but with long shaft
3	320 Wh	1405-00, 1406-00, 1407-00)	1240-20	Cruise 10.0 RS	High-efficiency outboard, 20 HP equivalent, including con-
1417-00	Spare battery Ultralight models, 915 Wh	High-performance lithium battery with integrated GPS receiver, 915 Wh, 29.6 V, 31 Ah. For all Ultralight models		UPDATE	nection to remote steering, 95 mm <sup>2</sup> cable set (4.5 m) includ- ing main switch and v22/p10k propeller, short shaft version. Throttle not included – best paired with TorqLink throttle part no. 1976-00
			1241-20	Cruise 10.0 RL UPDATE	As part No. 1240-20, but with long shaft
Travel			1242-20	Cruise 10.0 RXL UPDATE	As part No. 1240-20, but with extra-long shaft
1153-00	Travel 603 S	High-efficiency outboard with integrated 500 Wh high- performance floating lithium battery, 2 HP equivalent, includ- ing onboard computer with GPS-based range calculation, charger, emergency magnetic kill switch, short shaft	1243-20	Cruise 10.0 TS	High-efficiency outboard, 20 HP equivalent, with tiller steer- ing, integrated onboard computer with GPS-based range calculation, 95 mm <sup>2</sup> cable set (4.5 m) including main switch and v22/p10k propeller, short shaft version
1151-00	Travel 1103 CS	High-efficiency outboard with integrated 915 Wh high-per- formance lithium battery, 3 HP equivalent, including onboard	1244-20	Cruise 10.0 TL	As part No. 1243-20, but with long shaft
		computer with GPS-based range calculation and charger,	1245-20	Cruise 10.0 TXL	As part No. 1243-20, but with extra-long shaft
		emergency magnetic kill switch, short shaft	1250-00	Cruise 2.0 FP	High-efficiency pod motor (fixed position), 5-6 HP equivalent,
1152-00	Travel 1103 CL	As part No. 1151-00, but with long shaft			including throttle, integrated onboard computer with GPS-
1155-00	Spare battery Travel models, 500 Wh <b>NEW</b>	High-performance floating lithium with integrated GPS receiver, 500 Wh 29.6 V. For Travel 503/603 models.			based range calculation, 25 mm² cable set (3 m) including fuse, main switch and v13/p4000 propeller
1148-00	Spare battery Travel models, 915 Wh	High-performance lithium battery with integrated GPS receiver, 915 Wh 29.6 V.	1251-00	Cruise 4.0 FP	High-efficiency pod motor, fixed position, 8-9.9 HP equivalent, including throttle, integrated onboard computer with GPS-
Cruise					based range calculation, 25 $\rm mm^2$ cable set (3 m) including fuse, main switch and v13/p4000 propeller
1234-00	Cruise 2.0 TS	High-efficiency outboard, 5-6 HP equivalent, with tiller steer- ing, integrated onboard computer with GPS-based range cal- culation, 25 mm <sup>2</sup> cable set (3 m) including fuse, main switch and v13/p4000 propeller, short shaft version	1252-20	Cruise 10.0 FP <b>UPDATE</b>	High-efficiency pod motor (fixed position), 20 HP equivalent, including 95 mm <sup>2</sup> cable set (4.5 m) including main switch and v15/p10k propeller. Throttle not included – best paired with TorqLink throttle part no. 1976-00

Part No.	Product	Description
1905-00	Anode set Al Cruise 2.0/4.0 R/T/FP, Ultralight 1103 AC and Travel 603 and 1103 C	Anode for operating Cruise 2.0/4.0, Ultralight 1103 AC and Travel 603/1103 C models with standard propeller (with part No. 1915-00, 1916-00, 1923-00, 1933-00, 1953-00). Attach- ment to motor shaft made of aluminium for use in fresh water
1939-00	Anode set Zn Cruise 2.0/4.0 R/T/FP, Ultralight 1103 AC and Travel 603 and 1103 C	Anode for operating Cruise 2.0/4.0, Ultralight 1103 AC and Travel 603/1103 C models with standard propeller (with part No. 1915-00, 1916-00, 1923-00, 1933-00, 1953-00). Attach- ment to motor shaft made of zinc for use in salt water
1964-00	Anode set Al Cruise 2.0/4.0 FP with folding propeller	Anode set for Cruise 2.0/4.0 FP models with folding propeller (part No. 1962-00); consists of two ring anodes for attachment to the propeller and one anode for attachment to the pylon; made of aluminium for use in fresh water
1965-00	Anode set Zn Cruise 2.0/4.0 FP with folding propeller	As part No. 1964-00, but made of zinc for use in salt water
1935-00	Anode set Al Cruise 10.0 R/T	Anode set made of aluminium for use with Cruise 10.0 R / T in fresh water; consists of one shaft anode, two half-ring anodes and two ring anodes
1936-00	Anode set Zn Cruise 10.0 R/T	As part No. 1935-00, but made of zinc for use in salt water
1947-00	Anode set Al Cruise 10.0 FP with folding propeller	Anode set for Cruise 10.0 FP models with folding propeller (with part No. 1945-00); consists of two anodes for attach- ment to the propeller, two ring anodes and one anode for attachment to the pylon; made of aluminium for use in fresh water
1948-00	Anode set Zn Cruise 10.0 FP with folding propeller	As part No. 1947-00, but made of zinc for use in salt water
<b>Power</b> 2106-00	Power 24-3500	High-performance lithium battery, 3,507 Wh, rated voltage 25.2 V, weight 25.3 kq, with innovative battery management

4.0 systems

includes 0.9 m data cable.

2104-00 Power 48-5000

system including numerous protective functions, waterproof to IP67; includes cable for communication with Cruise 2.0 and

High-performance TorqLink-ready lithium battery, 5,000 Wh,

rated voltage 44.4 V, weight 37 kg, with innovative battery management system incl. safety functions; waterproof to IP67;

## Part No. Product Accessories

#### Extras

1925-00	Travel bags (2-piece)	For transporting / storing Travel models. Includes two bags, one for the motor (including tiller and accessories) and one for the battery.
1926-00	Travel battery bag	For transporting and storing Travel batteries
1977-00	USB adapter	USB adapter for charging USB devices from Travel or Ultralight batteries. For use only with batteries part No. 1146- 00, 1147-00, 1148-00, 1155-00, 1416-00 and 1417-00
1931-00	Protective cover Travel	For Travel models. Protects the motor cable from UV fading and the shaft head from dirt. Water-resistant and breathable
1924-00	TorqTrac	Smartphone app for Travel, Cruise T/R as well as Ultralight models. Allows larger display of the onboard computer show- ing range on map and with many other benefits. Requires a Bluetooth Low Energy®-capable smartphone
2216-00	Venting adapter Power 48-5000	Ventilation adapter for installing Power 48-5000 in cabins or closed compartments

Description

#### **Charging equipment**

1132-00	Sunfold 50	Foldable 50 W solar panel, convenient size, highly efficient, plug & play connections for waterproof charging of the Travel models and Ultralight 403 and 403 A/AC, only compatible with battery part No. 1146-00, 1147-00, 1148-00, 1416-00 and 1417-00
1133-00	Charger 90 W for Travel and Ultralight batteries	90 watt charger for electric sockets rated 100-240 V and 50- 60 Hz. For use only with batteries part No. 1146-00, 1147-00, 1148-00, 1155-00, 1416-00 and 1417-00
1128-00	12/24 V charger cable for Travel and Ultralight 403	Allows the Travel models and the Ultralight 403, 403 A/AC to be charged from a 12/24 V power source
2213-00	Charger 650 W for Power 48-5000	TorqLink-ready charger current 13 A, charges the Power 48-5000 from 0% to 100% in a maximum of 10 hours; waterproof IP65
2206-20	Charger 350 W for Power 24-3500 (Power 26-104)	Charge current 10 A, charges the Power 24-3500 (Power 26-104) from 0 to 100% in a maximum of 11 hours; waterproof to IP65
2210-00	Fast charger 1700 W for Power 24-3500 (Power 26-104)	Charge current 60 A, charges the Power 24-3500 (Power 26-104) from 0 to 100% in <2 hours; waterproof to IP65

#### Ordering information

Part No.	Product	Description
2212-00	Fast charger 2900 W for Power 48-5000	TorqLink-ready charger current 50 A, charges the Power 48- 5000 from 0 to 100% in <2 hours; waterproof to IP65
2207-00	Solar charge controller for Power 24-3500 (Power 26-104)	Enables the Power 24-3500 (Power 26-104) to be charged with solar energy (solar modules not included). Integrated MPPT maximises the energy yield of the solar modules during charging with very high level of efficiency. Maximum input power 232 W. For full specs visit torqeedo.com
2218-00	Solar charge controller for Power 48-5000 <b>NEW</b>	Enables the Power 48-5000 to be charged with solar energy (solar modules not included). Integrated MPPT maximises the energy yield of the solar modules during charging with very high level of efficiency. Maximum input power 325 W. For full specs visit torqeedo.com
2211-00	Fast solar charge control- ler for Power 24-3500 (Power 26-104)	Enables the Power 24-3500 (Power 26-104) to be charged with solar energy (solar modules not included). Integrated MPPT maximises the energy yield of the solar modules during charging with very high level of efficiency

#### **Propellers and fins**

1912-00	Spare propeller v10/p350	For Ultralight models, 403 and 403 A/AC (Ø 200 mm )
1972-00	Spare propeller	Standard propeller for Ultralight 1103,
	v10/p1100	optional propeller for Travel 603/1103 C, weedless
1973-00	Spare propeller v10/p1100	Standard propeller for Travel 603/1103 C
1917-00	Spare propeller v9/p790	For models Travel 1003 (C) and Travel 503 from 2014 (Ø 292 mm)
1953-00	Spare propeller v30/p4000	High-speed propeller for Cruise 2.0/4.0 models manufactured from 2017 onwards: for planing with light boats (Ø 320 mm)
1954-00	Spare propeller v13/p4000	For Cruise 2.0/4.0 models manufactured from 2017 onwards: slower speed, greater thrust (Ø 300 mm)
1955-00	Spare propeller v20/p4000	For Cruise 2.0/4.0 models manufactured from 2017 onwards: faster, more efficient, weedless (Ø 300 mm)
1961-00	Spare propeller v22/p10k	For all Cruise 10.0 models: medium speed for planing and displacement
1962-00	Folding propeller v13/p4000	For use with Cruise 2.0/4.0 FP models on sailboats
1937-00	Spare propeller v15/p10k	For all Cruise 10.0 models and optimised for high thrust
1938-00	Spare propeller v32/p10k	Speed propeller for all Cruise 10.0 models and optimised for planing
1945-00	Folding propeller v15/p10k	For use with Cruise 10.0 FP model on sailboats

Product	Description
Fin for Cruise R/T	Protects the outboard when running aground; for Cruise models with part No. 1209-00 to 1223-00
Fin for Cruise R/T	Aluminium fin coated in polyurethane (PU) foam for Cruise models with part No. 1230-00 to 1237-00. Better protection when running aground
Fin for Cruise 10.0 R / T	Protects the outboard when running aground
	Fin for Cruise R/T

#### Cable, control, steering

1970-00	Ultralight kayak bracket	Optimised kayak mount for Ultralight models. For part No. 1404-00 to 1408-00
1976-00	TorqLink throttle with colour display <b>NEW</b>	Top-mount throttle with color display for TorqLink/2021 Cruise 10.0 systems. Bluetooth and WLAN built in. Display shows all critical system info, GPS-based speed and remaining range. Includes a 3 m connecting cable
1918-00	Throttle for Travel models (spare part for Cruise and Ultralight models)	Enables operation with throttle instead of tillers for Travel models, including integrated display with information on battery status, GPS-based speed and remaining range calculation, including 1.5 m and 5 m connecting cables between motor and throttle. Can also be used as a spare part for Cruise 2.0 / 4.0 and Ultralight models
1921-00	Cable extension for throttle, 1.5 m	Extension cable for Travel, Ultralight and Cruise models allows a greater distance between throttle / tiller and motor
1922-00	Cable extension for throttle, 5 m	As part No. 1921-00, 5 m length
1949-00	Throttle Sail side-mount	Side-mount electronic throttle for sailboats with TorqLink and TorqTrac built in. Includes cables, on/off button, emergency off button and 1.28" display
1950-00	Throttle side-mount	Side-mount electronic throttle for motorboats with power trim and tilt. TorqLink and TorqTrac built in. Includes cables, key switch, emergency off button and 1.28" display
1951-00	Throttle top-mount	Top-mount electronic throttle for motorboats with power trim and tilt. TorqLink and TorqTrac built in. Includes cables, key switch, emergency off button and 1.28" display
1952-00	Dual throttle top-mount	Top-mount electronic throttle for twin-installation motor- boats with power trim and tilt. TorqLink and TorqTrac built in. Includes cables, key switch, emergency off button and 1.28" display
1956-00	TorqLink 3 m extension cable	TorqLink, 8-pin extension cable for a longer distance bet- ween the components. 3 m long
1957-00	TorqLink 5 m extension cable	As part No.1956-00, 5 m long
1958-00	TorqLink 0.5 m extension cable, angled-end	90° angled-end extension cable for rigging in tight spaces. As part No.1956-00, 0.5 m long

Part No.	Product	Description
1919-00	Long tiller arm	60 cm tiller tube extension for all Travel and Cruise T models
1920-00	Motor cable extension for Travel and Ultralight	Cable connection extension between battery and motor for the models Ultralight 403, 403 A/AC and Travel models; allows a greater distance (2 m) between battery and motor; waterproof plug connections
1204-00	Motor cable extension Cruise	Extension for Cruise cable set (between motor and battery), 2 m long, with plug connector
1914-00	Emergency magnetic kill switch	Emergency stop key and immobiliser for Travel and Cruise T as well as part no. 1918-00.
1978-00	Emergency magnetic kill switch for TorqLink throttle <b>NEW</b>	Emergency stop key and immobiliser for part No. 1976-00, TorqLink throttle with colour display
1927-00	Spare parts set Travel	Set for Travel consisting of emergency kill switch, battery attachment pin and steering fixing pin
1940-00	Cable bridges for AGM/gel batteries	Cable bridges for running Cruise 10.0 with AGM/gel batteries. Consists of four cables, 40 cm, 35 mm <sup>2</sup> with post terminal connector
2217-00	TorqLink gateway set	Gateway allows communication and connection between products with and without TorqLink. Also controls Power 48-5000 battery banks. Includes on/off switch for Power 48-5000 and 5 m extension cable.
1966-00	NMEA 2000 gateway set	Allows NMEA-2000 devices to access and display key motor and battery information from TorqLink-equipped drive systems
2304-00	On/off switch for Power 24-3500 (Power 26-104)	Switch for activating/deactivating the Power 24-3500; waterproof to IP65, with LED on/off status display; required when the Power 24-3500 (Power 26-104) is used without a Cruise system
2215-00	On/off switch for Power 48-5000	Switch for activating/deactivating the Power 48-5000 when used without a Torqeedo motor
1974-00	Parallel bridge cable for Power 48-5000 <b>NEW</b>	Bridge cable, 22 cm, 35 mm <sup>2</sup> with ring terminal connectors and M12 nuts for connecting two Power 48-5000 batteries in parallel
1934-00	Spare cable bridges Cruise models	Cable set for connecting two additional Power 24-3500 (Power 26-104) to a battery bank; includes one series bridge cable, 40 cm, 35 mm <sup>2</sup> with post terminal connector, four parallel bridge cables, 40 cm, 35 mm <sup>2</sup> with ring terminal con- nectors and M12 nuts, two data cables, 1.5 m with waterproof data plug connectors
1975-00	Hybrid safety kit <b>NEW</b>	Disables the drive system while charging from shore power. Installation by boat builder or certified electrician; additional parts required

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Torqeedo products are engineered and manufactured to the highest quality standards. Torqeedo motors and accessories are designed for long use in difficult conditions and must prove this in testing in continuous use. Every single product is carefully inspected before delivery. Certification to the internationally recognised quality management standard ISO 9001 is a guarantee of the quality of our products.

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Part no. 8045-00

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