

TORQUEEDO
STARNBERG.GERMANY

CATALOGUE 2011



**THE LEADER IN CLEAN
OUTBOARDS**

THERE ARE 2 SIMPLE PRINCIPLES BEHIND EVERY TORQEEDO PRODUCT: SUPERIOR TECHNOLOGY AND REVOLUTIONARY BENEFIT



Since 2005, Torqeedo has been engineering and introducing industry first designs to create a new way of clean boating.

Based on an uncompromising high-tech approach, our products have continuously set record-level overall efficiencies for marine drives. As available battery capacity typically is the limiting factor for power and range of electric drives, using the limited battery supply with utmost efficiency is paramount. Our superior efficiency levels have set our products apart from the rest of the market. They simply offer more power and range.

How much we have taken the efficient use of resources to the limit becomes obvious when comparing our outboards' consumption of electricity with gasoline consumption levels of internal combustion outboards: Torqeedo outboards run for up to 16 nautical miles on the energy equivalent to 20 grams of petrol. In other words: they run for 100 kilometers on the energy equivalent to 70 grams of gasoline.

With this unrivalled performance and with pioneering lithium batteries for marine propulsion applications, we have made electric outboards an alternative where they had not been used before.

2011 is no different in our history of superior technology and revolutionary benefit. For the coming season, each and every

outboard in our product lineup is available in an improved version! Whether it is a substantially increased battery capacity for the Ultralight and Travel models or whether it is improving our own record setting levels of efficiencies even further with new propeller designs for the Cruise outboards: Every outboard that we offer has been improved for 2011.

Additionally, we continue to offer groundbreaking innovations:

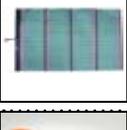
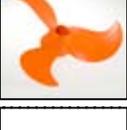
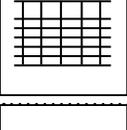
Our new lithium-battery Torqeedo Power 26-104 sets a completely new standard when it comes to intelligence, performance, safety and value. Our new Twin-Cruise outboards carry efficient electric outboards into the next power class.

We will continue and strive to push the limits for electric propulsion and to engineer the best possible products in the market. I invite you to learn more about our unrivalled product range and our extraordinary organization on the next pages.

Dr. Christoph Ballin
Co-Founder and CEO



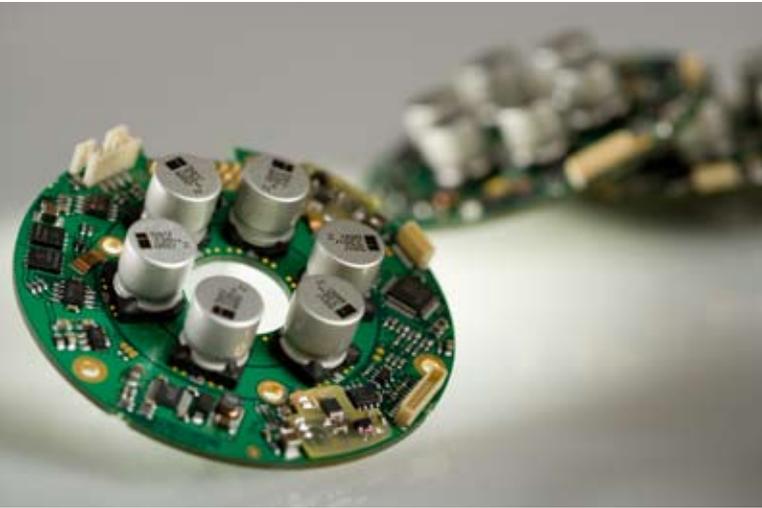
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TORQEEDO TECHNOLOGY

SUPERIOR TECHNOLOGY FOR SUPERIOR PRODUCTS

Torqueedo motors define new standards of efficiency and performance per weight and volume. This is the result of careful and uncompromising optimization of the individual components and their interaction combined with the very latest technology in this performance class.



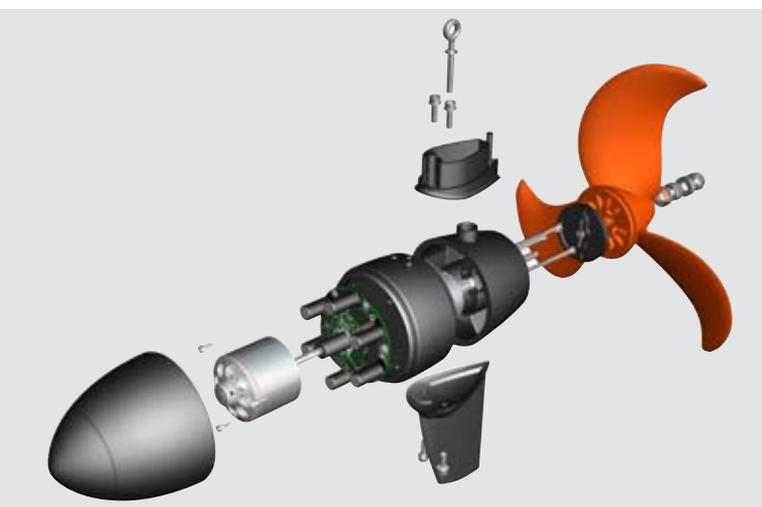
BRUSHLESS ELECTRONIC COMMUTATION:

In conventional motors, the alternating field necessary for driving the electric motor is provided by friction contacts commonly known as brushes. Torqueedo motors generate the alternating field contact-free via an electronic digital circuit. It is integrated in the drive system and regulates the motor 35,000 times per second. The advantages of this method are significant. The caster angle of the alternating field is better adjusted to the load and speed, making it more efficient. Additionally, there are no brush losses and the motors are maintenance-free.



OUTRUNNER DESIGN:

In conventional electric motors, the rotor is located inside and surrounded by the stator. The magnets are on the inside and the coils that generate the alternating field are on the outside. Consequently, the magnetic field where the torque is generated lies relatively far inside so that this design only produces a low torque. Torqueedo uses outrunners which have the coils arranged internally and the magnets are on the outside. With this design, the field where the torque is generated can be arranged further to the outside of the motor. This provides additional leverage and produces a higher torque. Additionally, the area covered by the magnets is greater on the outside, which results in even more torque.



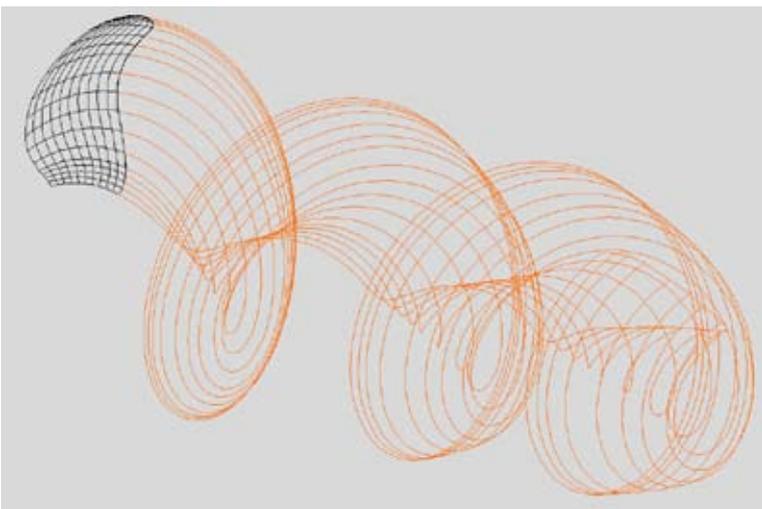
RARE-EARTH MAGNETS:

Torqueedo uses rare-earth magnets instead of the usual hexaferrite magnets. They have six times the field strength, which means they deliver six times the torque.



CONVENTIONAL PROPELLER OPTIMIZATION:

Generally, propellers with a large diameter and high pitch, which turn slowly in water, have the highest degree of efficiency. This is because a large propeller diameter results in a high propellant flow, while a high propeller pitch has a positive effect on the additional speed induced by the propeller. In contrast, increasing rotational speed of the propeller leads to decreasing efficiencies. As a result of their exceptionally high torque, Torqeedo motors are able to drive highly efficient propellers. In other words, they can rotate large high-pitch propellers relatively slowly in the water.



MULTIDIMENSIONAL PROPELLER OPTIMIZATION:

Most propellers used in outboard motors today are based on a series of tests carried out in the 1940's to 1960's in the Wageningen test facilities in the Netherlands and by the US Navy. The results are reflected in general design principles and applied by rule of thumb. However, for some years now, large modern ships have been fitted with propellers designed according to a multidimensional optimization calculation. Unlike standard propellers, they feature pitches and cambers that are not (almost) constant over all the propeller segments. Instead, pitch and camber are optimized on the basis of a vortex grid calculation method and a stepwise optimization over many thousand iterations for each propeller segment. With these additional design scopes, Variable-Pitch-Variable-Camber-Propellers achieve additional speed induced by the propeller at top efficiency.



LITHIUM BATTERY TECHNOLOGY:

Lithium-based battery systems are by far the most powerful energy carriers currently available. Their special feature is their high energy density giving them the capability of storing larger quantities of energy than other batteries. In addition, lithium batteries can withstand high current, resulting in the ability to deliver their capacity even under high loads. Both of these properties are very significant for applications in boat drives. Besides performance, safety is a key requirement for lithium batteries. Four criteria make a safe lithium battery: safe battery chemistry, precise and clean production processes at cell manufacturer level, safe casing of individual battery cells, and advanced protective electronics and safety mechanics.

PROPULSIVE POWER AND OVERALL EFFICIENCY

WHAT EVERY USER SHOULD KNOW ABOUT OUTBOARD POWER RATINGS

Different manufactures for marine drive systems use different performance ratings for their products.

The most meaningful performance indicator is the **propulsive power** of a drive system. It describes the power actually delivered for propelling the vessel (taking into account all losses including propeller losses). It is defined as speed times thrust exerted onto a boat and can be expressed in watts or horsepower. In commercial shipbuilding, this performance indicator has been used for almost 100 years. Yet, in recreational boating other less informative indicators are typically used.



Gasoline outboards

Power rating = Shaft power
(expressed in hp or watts)

Manufacturers of gasoline outboards do not state the propulsive power of their motors. Instead they quote the shaft power measured at the propeller shaft. The shaft power does not account for propeller losses. As propeller losses can amount up to almost 80% of the rated shaft power for small outboards, the shaft power is not a meaningful performance indicator. As electric outboards can have substantially lower propeller losses (due to favourable torque characteristics of modern electric motors) shaft power is not suitable to compare gasoline outboard and electric outboard performance.



Conventional electric outboards

Power rating = Input power
(expressed in watts or hp)

Input power indicates the energy consumption of a motor. However, it does not tell how much of the power being consumed is actually being supplied to the boat. The differences in overall efficiencies among electric outboards are substantial: They range from 18% overall efficiency at the low end (i.e. 82% of the input power is lost along the drivetrain) up to 56% at the top (Torqeedo Cruise). Given these huge differences, describing a motor primarily by its input power is as useful as specifying the performance of an automobile primarily by its fuel consumption.



Trolling motors

Power rating: Static thrust
(expressed in lbs or lbf)

Static thrust indicates the ability of a motor to move a boat from a stand still position to an infinitely slow moving speed. It does not say anything about the ability of a motor to move a boat at a normal speed.



Torqeedo electric outboards

Power rating: Propulsive power
(expressed in watts or hp)

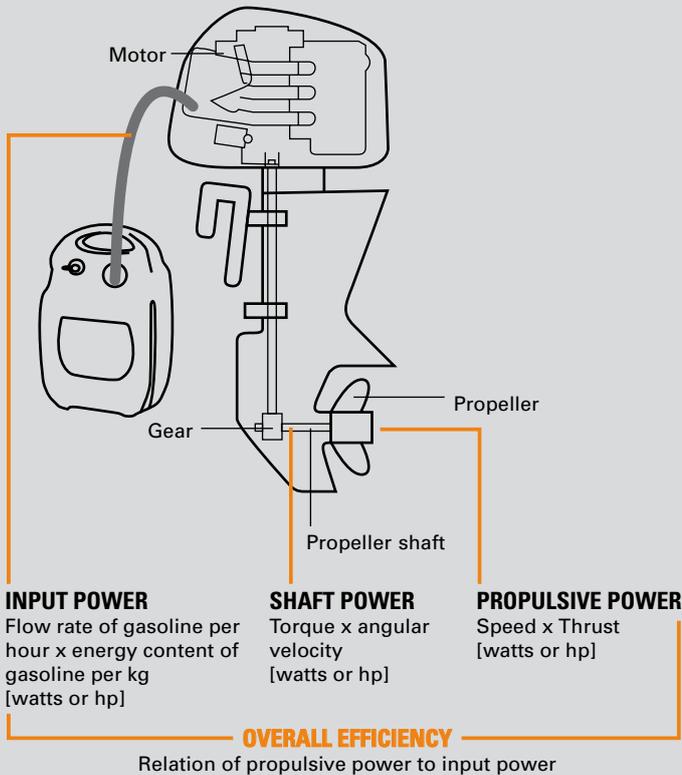
Just like manufacturers of container and tanker ships, at Torqeedo, we always go by the propulsive power of our outboards, i.e. the power actually delivered to drive a boat after consideration of all losses incl. propeller losses. This describes the actual power available to drive a boat. Focusing on propulsive power also allows the comparison of electric outboards with gasoline outboards and trolling motors, as the propulsive power for all outboard types can be measured with the same test regime. On top of providing the propulsive power ratings for our outboards, we also provide input power and static thrust data for the sake of completeness.

When dealing with electric outboards, boaters also need to consider the overall efficiency of an outboard. It describes the percentage share of propulsive power in comparison to input power (calculated: propulsive power divided by input power).

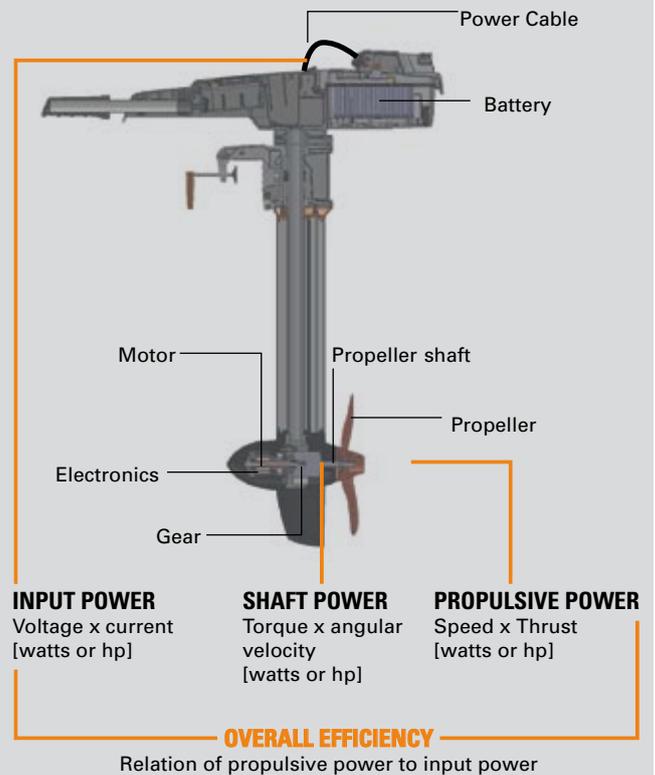
For electric outboards the overall efficiency is a key performance indicator: Since batteries only have a small fraction of the energy density compared to gasoline, the battery capacity is almost always the limiting factor for power and range of an electric motor. Higher overall efficiencies result in more power and range. With overall efficiencies for electric outboards and trolling motors ranging between 18 and 56%, the different performances are noteworthy. For gasoline outboards, the overall efficiency is not such an important performance indicator. Due to the high energy density of gasoline, poor efficiencies can be healed with higher petrol consumption. The overall efficiencies of small gasoline outboards are therefore particularly poor and range around 5%. I.e. 95% of the energy supplied to a small gasoline outboard is lost in the drivetrain and only 5% arrives at propelling the boat. There are plenty of situations in which you cannot avoid pollution. Running a small outboard is no longer one of them.

PERFORMANCE INDICATORS OF BOAT DRIVES

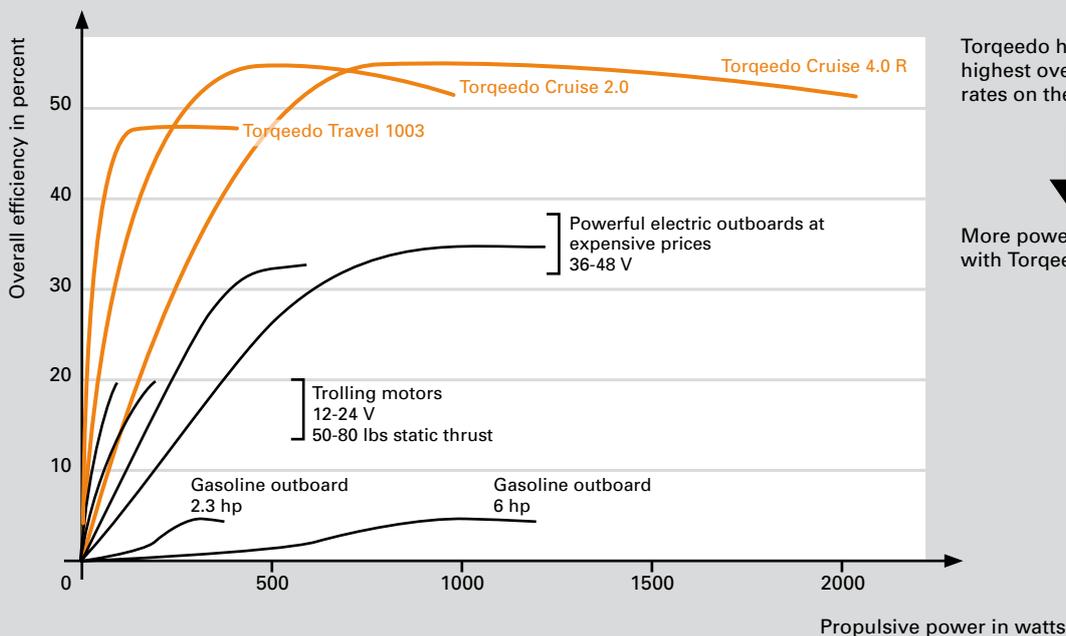
GASOLINE OUTBOARDS



ELECTRIC OUTBOARDS



PROPULSIVE POWER AND OVERALL EFFICIENCY RATES OF VARIOUS OUTBOARDS



Torqueedo has by far the highest overall efficiency rates on the market.



More power and range with Torqueedo outboards.

ULTRALIGHT 403

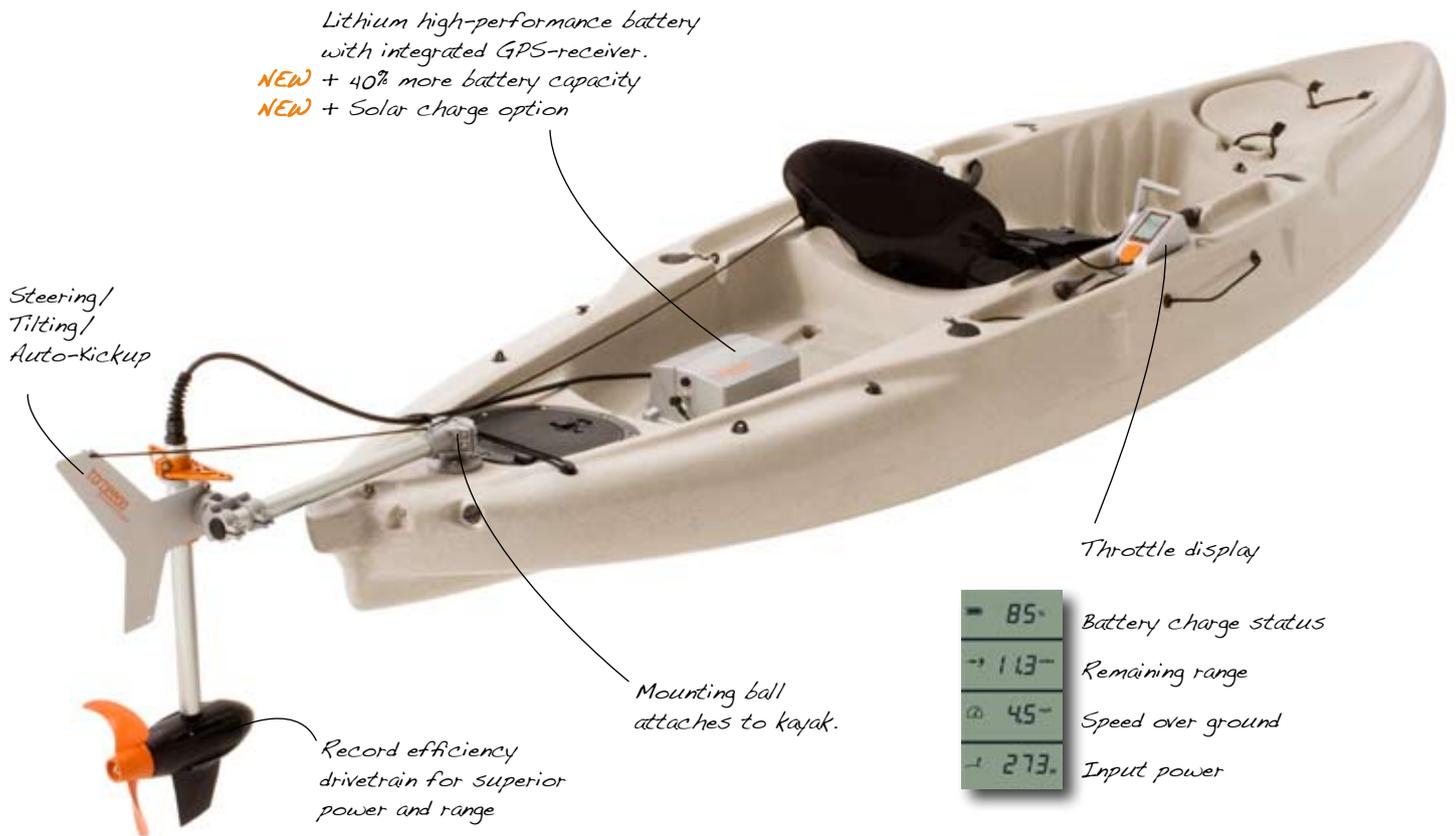
*improved
2011 version*

THE KAYAK MOTOR

Whether it is for fishing in your local water or cruising down a long winding river on a sunny afternoon: kayak motors increase kayaker's options to enjoy time on the water. With regards to performance and convenience nothing comes close to a Torqeedo Ultralight 403.

KEY FEATURES

- Total weight 7 kg incl. battery
- Top speed around 9-10 km/h, faster than any trolling motor
- Range at slow speed 42 km (e.g. at 4 km/h)
- Fully waterproof (IP67)
- GPS calculation of remaining range
- Solar-chargeable



1 HP



29.6 V (integrated)



7 kg



2-year limited warranty

Ultralight 403 with integrated battery (29.6 V / 11 Ah) Fishing kayak (Hobie Mirage Revolution), 4,1 m, 26,3 kg

	Speed in km/h	Range in km	Run time in hours
Slow speed	4.2	35.2	8:20
Half throttle	6.0	25.0	4:10
Full throttle	9.3	7.4	0:48

Ultralight 403 with integrated battery (29.6 V / 11 Ah) Touring kayak (Prijon Prilite T470), 4,7 m, 23 kg

	Speed in km/h	Range in km	Run time in hours
Slow speed	4.2	42.0	10:00
Half throttle	6.2	26.0	4:10
Full throttle	9.8	7.8	0:48



Hobie eVolve available with rudder mounting and mirage well mounting



FOR HOBIE KAYAKS



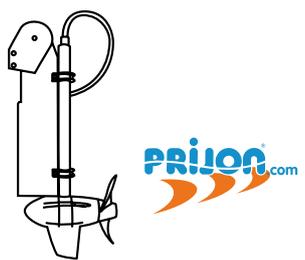
Ask your Hobie dealer for the Hobie eVolve kayak motor.

FOR GRABNER KAYAKS



Ask your Grabner dealer for the Ultralight 403 and its mounting kit.

FOR PRIJON KAYAKS



Ask your Prijon dealer for the Ultralight 403 and its mounting kit.

Details

Mounting: 4 mounting options available. For the use with Hobie kayaks, the Hobie specific motor “eVolve” is recommended (available through Hobie dealerships). For the use with Grabner kayaks, please use Grabner mounting kits. For the use with Prijon kayaks, please use the Prijon rudder mount. By using the mounting ball included in the delivery, the Ultralight can be mounted onto almost any kayak. **Steering:** can be attached to kayak’s own steering system/rudder. **Watertightness:** All motor components are watertight, protected against complete immersion. **Safety:** The motor shuts off when the magnetic key on the remote throttle control is removed. Therefore, for safety reasons, the magnetic key should be attached to the wrist or the life vest. If the kayak capsizes, the motor shuts off automatically to avoid possible injury. **Battery charge time:** When fully discharged, the charge time with the charger supplied is approx. 12 hours. **Lithium battery life expectancy:** Charge cycles are not the main factor affecting the service life of the lithium-manganese battery. The battery does not have a memory-effect. Generally, a loss of capacity of 4% per year can be assumed. Ageing is accelerated if the battery is exposed to high temperatures for long periods and if it is stored fully charged for long periods. Therefore, the battery can be used in very hot conditions, but should be removed from the sun and stored in a cool place when not used. If it is stored for a longer period of time, its charge status should be about 50%. If these instructions are followed, your battery will have a life expectancy of some 6-10 years. **Integrated battery specifications:** The integrated battery has a capacity of 320 Wh, i.e. 11 Ah at 29.6 V. **For technical data and ordering information, turn to pages 22/23.**

TRAVEL 503/1003

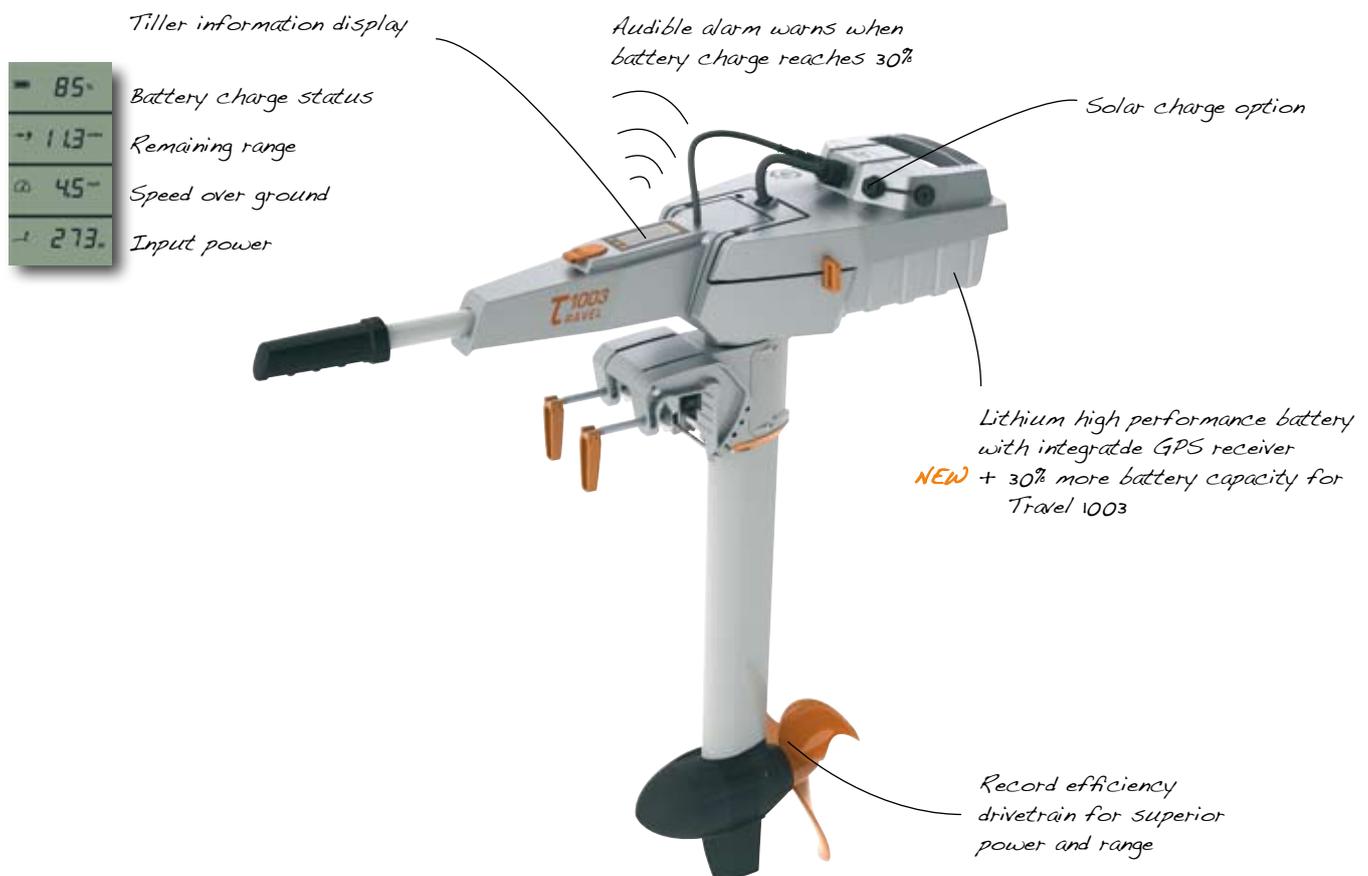
*improved
2011 version*

LIKE A NORMAL PORTABLE OUTBOARD – JUST MORE CONVENIENT AND CLEANER

Whether you are planning to power your dinghy, RIB or day-sailer, the Travel outboard is the perfect choice. It's integrated lithium-battery and it's record-efficiency drivetrain make it the only alternative to a gasoline outboard for small crafts.

KEY FEATURES

- Same weights, speeds and ranges as a portable gasoline outboard
- Fully waterproof (IP67)
- GPS calculation of remaining range
- Solar-chargeable
- Can be disassembled for easy transport and storage



Travel 503 ____ 1.5 HP

Travel 1003 ____ 3.0 HP



Travel 503 ____ 29.6 V (integrated)

Travel 1003 ____ 29.6 V (integrated)



Travel 503 ____ 12.7 kg (s)/13.3 kg (L)

Travel 1003 ____ 13.4 kg (s)/14.0 kg (L)



2-year limited warranty





Melges 20 with Travel 1003 S

Details

Which Travel motor for which boat? The Travel 503 and 1003 models are both suitable for inflatables, small boats and sail boats. We recommend the Travel 503 for sail boats up to a weight of 750 kg, and the Travel 1003 up to a weight of 1.5 tons. Both models consume the same level of energy at the same speed. The stronger Travel 1003 has 60% higher battery capacity and therefore superior range. Both models are available in long and short shaft versions.

Battery charge time: The battery recharge time from empty to full ranges between some 9 hours (Travel 503) and 15 hours (Travel 1003). **Lithium battery life expectancy:** Charge cycles are not the main factor affecting the service life of the lithium-manganese battery. The battery does not have a memory-effect. Generally, a loss of capacity of 4% per year can be assumed. Ageing is accelerated if the battery is exposed to high temperatures for long periods and if it is stored fully charged for long periods. Therefore, the battery can be used in very hot conditions, but should be removed from the sun and stored in a cool place when not used. If it is stored for a longer period of time, its charge status should be about 50%. If these instructions are followed, your battery will have a life expectancy of some 6-10 years. **Integrated battery specifications:** The batteries of the Travel motors have a capacity of 320 Wh (Travel 503) and 520 Wh (Travel 1003). The batteries are rated 11 Ah @ 29.6 V (Travel 503) and 18 Ah @ 29.6 V (Travel 1003). **Charging the Travel battery from solar and from the on-board power supply:** The battery can be solar charged also while using the motor. It comes with a charge connector that accepts the PowerFilm solar charger on page 20 or other solar chargers with a voltage between 24 V and 60 V and a charging current of 4 Amps max. To charge the battery from an on-board power supply, you will need an inverter that converts the on-board voltage to a value between 100 and 240 V (standard power outlet voltage, country-specific voltages may vary). High-efficiency inverters are available on the market at very affordable prices. **Watertightness:** All motor components are watertight, protected against complete immersion. **Safety:** The motor shuts off when the magnetic key on the remote throttle control is removed. Therefore, for safety reasons, the magnetic key should be attached to the wrist or the life vest. **Temperature protection:** Operators in warm weather climates may experience the motor reducing power after running for 15-30 minutes at full throttle. Please note that this is not a defect, but the temperature protection mode to ensure that your battery does not reach extreme temperatures. A thermometer will be indicated during temperature protection mode in your display. **For technical data and ordering information, turn to pages 22/23.**

Travel 503 with integrated battery (29.6 V / 11 Ah) Inflatable, dinghy, sailboat up to 750 kg

	Speed in knots	Range in nm	Run time in hours
Slow speed	1.5 - 2.0	9.6 - 12.8	6:20
Half throttle	2.5 - 3.0	5.3 - 6.4	2:08
Full throttle	3.6 - 4.0	2.6 - 2.8	0:42

Travel 1003 with integrated battery (29.6 V / 18 Ah) Inflatable, dinghy, sailboat or daysailer up to 1.5 tons

	Speed in knots	Range in nm	Run time in hours
Slow speed	1.5 - 2.0	15.0 - 20.0	10:30
Half throttle	2.5 - 3.0	8.5 - 10.5	3:30
Full throttle	4.5 - 5.0	2.5 - 2.8	0:35

CRUISE 2.0 (TILLER VERSION)

*improved
2011 version*

PRIMARY POWER AT AFFORDABLE PRICES

If you are looking for a strong electric outboard that provides you with the maximum power and range from any given battery supply – look no further. The Torqeedo Cruise is in a completely different league when it comes to power and range compared to a trolling motor.

The record-level efficiency of the Cruise outboards is also superior over electric outboards from smaller electric outboard builders. This means more power and range. Due to our industrial approach to research, development and manufacturing, we can nevertheless offer the Cruise 2.0 at an attractive and affordable price.

KEY FEATURES

- More power per watt: superior overall efficiency provides more power and range from a given battery supply compared to any other outboard (see p. 4-5).
- Lightweight yet strong.
- Affordably priced.

Stepless forward/reverse

Voltage indicator provides information on battery charge status

25 mm² cable set including fuse and main switch included

*Record efficiency drivetrain for superior power and range
NEW + Improved efficiency and speed due to new propeller design.*



5-6 hp



24 V



18.5 kg (S) / 19.0 kg (L)



2-year limited warranty





Princecraft DL series with Cruise 2.0 L

Details

Battery supply: The Cruise 2.0 requires a battery voltage of 24 V. Torqeedo recommends that you use at least one lithium-manganese battery from the Torqeedo Power series. If you choose to use a Lead-based battery, please remember that they are not resistant to high current, i.e. the capacities indicated on the casing are not available when the batteries are to be fully discharged in a short time (e.g. 1 or 2 hours). **Connection to remote throttle/steering:** No longer available with this model. For this application, we developed our new models, Cruise 2.0 R and 4.0 R. See details on pages 16/17. **Saltwater use:** The Cruise R models shown on pages 14/15 are better suited for the use in salt water than this tiller version. They are also waterproof IP 67. Using the Cruise 2.0 tiller version in saltwater does require protection of the contacts and protection from complete submersion. **For technical data and ordering information, turn to pages 22/23**

Cruise 2.0

2 x 12 V / 200 Ah lead batteries (battery weight ca. 120 kg)
Dinghies, sailboats up to 3 tons

	Speed in knots	Range in nm	Run time in hours
Slow speed	~1.5	~165.0	110:00
Half throttle	~2.6	~43.0	16:30
Full throttle	5.0 - 6.5	10.0 - 13.0	2:00

Cruise 2.0

1 x Torqeedo Power 26-104 (battery weight 20 kg)
Dinghies, sailboats up to 3 tons

	Speed in knots	Range in nm	Run time in hours
Slow speed	~1.5	~90.0	60:00
Half throttle	~2.5	~23.0	9:00
Full throttle	5.0 - 6.5	6.8 - 8.8	1:20

CRUISE 2.0 R/4.0 R

*improved
2011 version*

THE STANDARD FOR POWERFUL ELECTRIC OUTBOARDS

The Cruise R models come with a whole set of superlatives. No wonder they have become the preferred outboards for boaters looking for powerful electric propulsion. As all Torqeedo drives, they are by far the highest efficiency outboards in their power class. This means that they get more power and range from a given battery supply than any other outboard on the market. In addition they feature extremely helpful user-information in their throttle-display: battery status, GPS-based speed and GPS-based real time information on remaining range.

KEY FEATURES

- More power per watt: superior overall efficiency provides more power and range from a given battery supply compared to any other outboard (see p. 4-5 for additional info).
- Integrated display providing information on battery status, GPS-based speed and GPS-based remaining range.
- Fully waterproof (IP67)
- Lightweight yet strong



Connection for standard remote steering

25 mm² cable set including fuse and main switch included



Remote throttle information display

Battery charge status

Remaining range

Speed over ground

Input power



*Record efficiency drivetrain for superior power and range
NEW + Improved efficiency and speed due to new propeller design*



Cruise 2.0 R ____ **5-6 HP**

Cruise 4.0 R ____ **8-9.9 HP**



Cruise 2.0 R ____ **24 V**

Cruise 4.0 R ____ **48 V**



Cruise 2.0 R ____ **16.8 kg (S)/17.2 kg (L)**

Cruise 4.0 R ____ **17.1 kg (S)/17.5 kg (L)**



2-year limited warranty



Current Sunshine, 43' with Cruise 4.0 R



Calypso Classic 23e with Cruise 4.0 R

Details

Battery supply: The Cruise 2.0 R requires a battery voltage of 24 V. It can be run from one battery of the new Torqeedo Power 26-104 (see page 18/19). This way the battery supply weighs less than 20 kg. Alternatively it can be run from at least 2 lead-gel or AGM batteries. In this case we recommend a battery capacity of at least 180 Ah. As lead-gel or AGM batteries cannot deliver high currents well, the design capacity of the battery bank should allow for some reserves. The Cruise 4.0 requires a battery voltage of 48 V. It can be run from 2 batteries of the new Torqeedo Power 26-104 (see page 18/19). This way the battery supply weighs less than 40 kg. Alternatively it can be run from at least 4 lead-gel or AGM batteries. In this case we also recommend a capacity of at least 180 Ah for the reasons mentioned above. **On board information display:** The computer integrated in the remote throttle control analyses and combines information received from the motor, batteries and GPS. The motor-consumption and GPS-speed data are always accurate. The battery information is fairly accurate if the Cruise is operated together with Torqeedo's Power 26-104 battery, as both products communicate with each other. If the Cruise is operated with other batteries, the battery information is based on estimates derived from battery information entered into the system in the setup-menu.

For technical data and ordering information, turn to pages 22/23

Cruise 2.0 R

2 x 12 V / 200 Ah lead batteries (battery weight ca. 120 kg)
Dinghies, sailboats up to 3 tons

	Speed in knots	Range in nm	Run time in hours
Slow speed	~ 1.5	~ 165.0	110:00
Half throttle	~ 2.6	~ 43.0	16:30
Full throttle	5.0 - 6.5	10.0 - 13.0	2:00

Cruise 4.0 R

2 x Torqeedo Power 26-104 (battery weight 40 kg)
Motorboats and sailboats up to 4 tons

	Speed in knots	Range in nm	Run time in hours
Slow speed	3.0	24.0	8:00
Half throttle	4.5	13.5	3:00
Full throttle	6.0 - 11.0*	7.0 - 13.0*	1:10

* Maximum speeds are planing speeds for light boats

TWIN CRUISE 2.0 R/4.0 R

NEW
2011

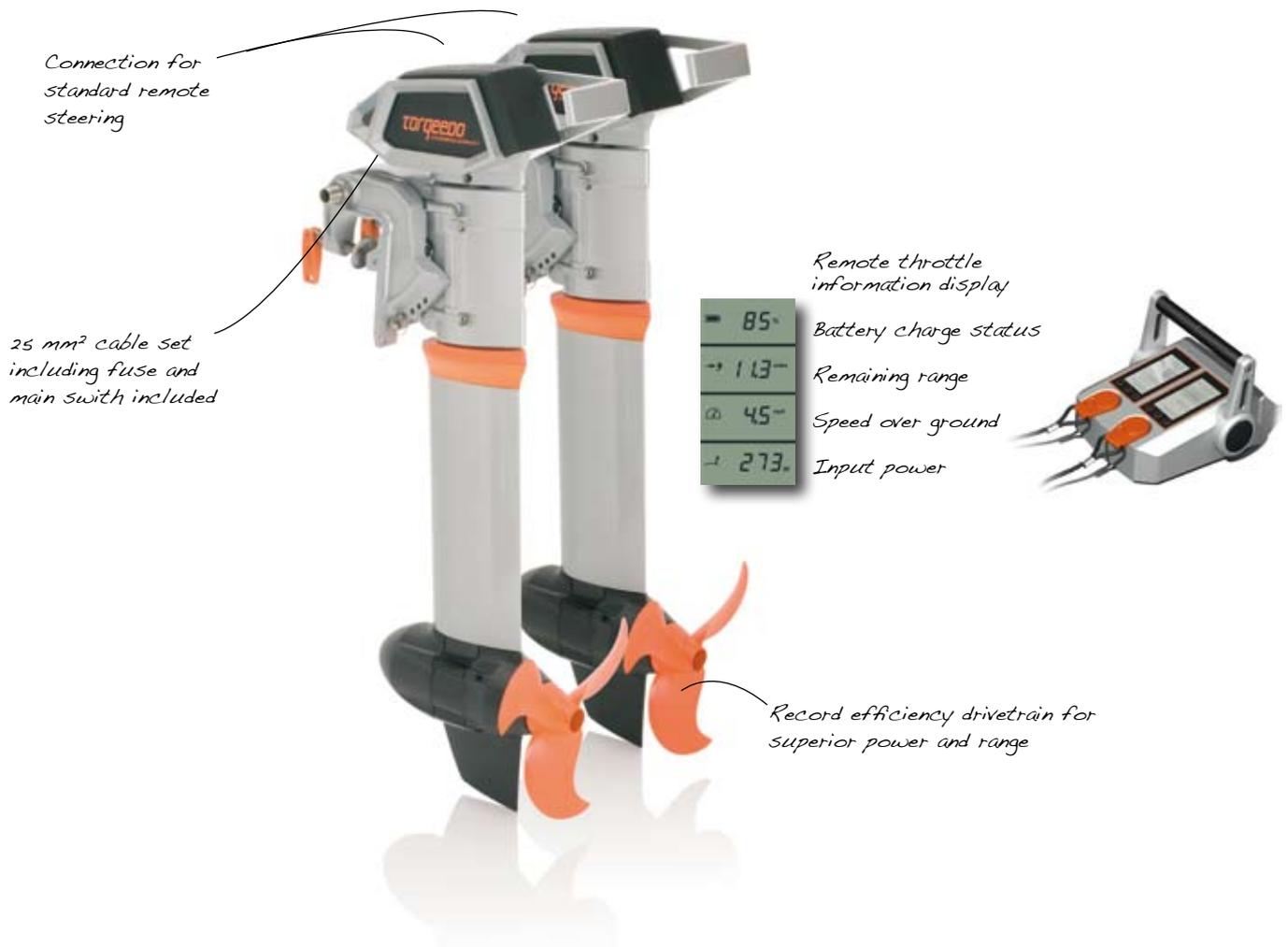
POWER REINFORCED

The new Twin Cruise outboards provide you with all the benefits of our high-performance Cruise models – just with twice the power.

This is great news for boaters who want to combine the option of going faster with the option of going longer distances using extremely efficient propulsion. It is also great news for boaters wanting to run larger boats such as pontoons, larger sailboats and larger catamarans with electric propulsion.

KEY FEATURES

- Combining speed and range for planing electric boats
- Moving larger boats with electric propulsion
- Aluminum twin throttle for easy maneuvering
- Integrated display providing information on battery status, GPS-based speed and GPS-based remaining range.
- Fully waterproof (IP67)



Twin Cruise 2.0 R ___ 8 HP
Twin Cruise 4.0 R ___ 15 HP



Twin Cruise 2.0 R ___ 24 V
Twin Cruise 4.0 R ___ 48 V



Twin Cruise 2.0 R ___ 33.6 kg (S)/34.4 kg (L)
Twin Cruise 4.0 R ___ 34.2 kg (S)/35.0 kg (L)



2-year limited warranty





Gold Rush Aggressor Carbon Fiber with Twin Cruise 4.0 R

Details

System components: A Twin Cruise outboard system consists of two standard Cruise models (2.0 R or 4.0 R, S or L models) as well as the Twin Cruise Control Set. The Twin Cruise Control Set consists of a dual throttle as well as a connection bar to connect two Cruise outboards to the same standard steering system.

Motor installation: Standard installation with the Twin Cruise Control Set requires minimum transom width of 76 cm (tie bar to connect two motors included in delivery, length 56 cm). For all other installations, please refer to owner's manual available under www.torqeedo.com.

Battery supply: The Twin Cruise 2.0 R requires a battery voltage of 2 times 24 V (24 V for each motor). It can be run from two batteries of the new Torqeedo Power 26-104 (1 battery for each outboard, see page 18/19 for details). This way the battery supply weighs less than 40 kg. Alternatively it can be run from at least 4 lead-gel or AGM batteries. In this case we recommend a battery capacity of at least 180 Ah. As lead-gel or AGM batteries cannot deliver high currents well, the design capacity of the battery bank should allow for some reserves. The Twin Cruise 4.0 requires a battery voltage of 2 times 48 V (48 V for each motor). It can be run from 4 batteries of the new Torqeedo Power 26-104 (2 for each outboard). This way the battery supply weighs less than 80 kg. Alternatively it can be run from at least 8 lead-gel or AGM batteries. In this case we also recommend a capacity of at least 180 Ah for the reasons mentioned above.

On board information display: The computer integrated in the remote throttle control analyses and combines information received from the motor, batteries and GPS. The motor-consumption and GPS-speed data are always accurate. The battery information is fairly accurate if the Twin Cruise is operated together with Torqeedo's Power 26-104 batteries, as these products communicate with each other. If the Twin Cruise is operated with other batteries, the battery information is based on estimates derived from battery information entered into the system in the setup-menu.

Twin Cruise 4.0 R

4 x Torqeedo Power 26-104 (battery weight 80 kg) and propeller v30/p4000

18' carbon center-console boat, weight 272 kg

	Speed in km/h	Range in km	Run time in hours
Half throttle	11	39.4	3:30
Cruising speed	16	32.2	2:00
Full throttle	26	27.8	1:05

POWER 26-104

NEW
2011

A CLASS OF ITS OWN IN PERFORMANCE, SAFETY AND VALUE

Torqueedo has been setting standards for lithium batteries for marine applications since 2006. With our new Power 26-104 we are continuing that tradition, by taking lithium power supply for boats to a completely new level.

KEY FEATURES

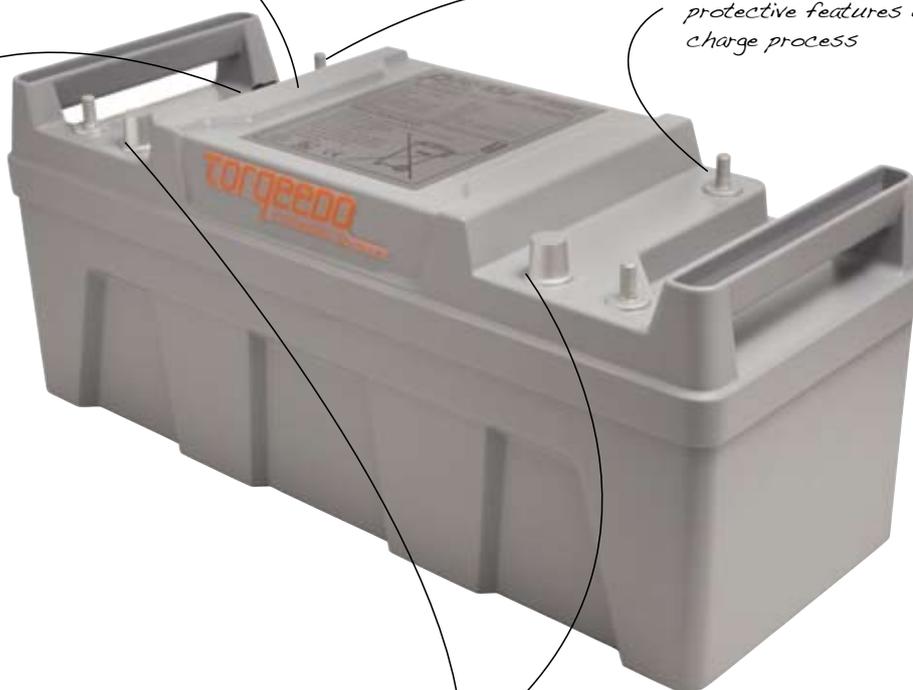
- **Superior Intelligence:** Stand alone solution. Protection against short circuits and maltreatment (wrong charging, deep discharge, wrong polarity etc.) included in battery management system. No external accessories needed to perform protective services.
- **Higher efficiency:** Capacity of 2,685 Wh from just 20 kg of battery weight (134 Wh/kg).
- **Better pricing:** Compare country specific price level with other makes (watt-hours per €, \$, £ etc.)
- **Superior safety:** Safe battery chemistry, precise and clean production processes at the cell manufacturer level (Japanese origin), safe packaging due to 4 safety-hardware features for each individual cell, cutting edge integrated electronic battery management system.
- **Uncompromising design for marine use:** Fully submersible IP67 (voltage shut-off from terminals in case of submersion to avoid galvanic effects).

Advanced battery management system with various protective features included in the battery

Separate charge channel for protective features during charge process

Dataports for communication e.g. with Cruise outboards

If multiple batteries are used connecting their dataports will provide information about the entire battery bank



2 positive and 2 negative terminals for convenient installation



___ 2.7 kWh (25.9 V, 104 Ah)



___ 20 kg



___ 134 Wh/kg



___ 577.5 x 218.5 x 253.5 mm

Specifications		
General characteristics		
Capacity	2,685 Wh	
Nominal Voltage	25.9 V	
Final Charge Voltage	29.05 V	
Final Discharge Voltage	21.0 V	
Nominal Charge	104 Ah	
Max Charge	108 Ah	
Max discharge rate (A)	160 A	Safety feature (power supply not starter battery)
Max discharge rate (W)	4,500 W	
Weight	20 kg	
Dimensions	577.5 x 218.5 x 253.5 mm	
Volume	32 l	
Battery chemistry	LiNiCoMnO2	
Benchmark information		
Energy density (weight)	134 Wh/kg	
Energy density (volume)	84 Wh/l	
Power density (weight)	225 W/kg	
Power density (volume)	141 W/l	
Lifetime Data		
Cycle Lifetime	800 cycles @ 100% DoD @ 25°C	Resulting in capacity loss of 25%
Average capacity loss per year	-4 % @ 25 °C ambient temperature	
Handling information		
Operating cell temperature	-20° to +60°C	Battery protects itself
Charge cell temperature	0° to +55°C	Battery protects itself
Storage temperature	-30° to +55 °C	
Self discharge rate in Deep Sleep Mode	< 200 µA	Represents 1.6 % per year
Self discharge of cells	4 % per year	
Separate charging channel	Yes	
Charge rate via charging channel	15 A	Charge time < 8 hours from 0% to 100% (consistent with Torqeedo charger)
Connection	Max 2S8P or 1S16P (larger banks require authorization)	

Max Quick-Charge rate via discharge channel	100 A	Charge time < 1.2 hours
Protection class	IP 67	Waterproof, can be submersed @ 1 m depth for 30 minutes without damage
Battery composition		
Number of cells	336	
Cell housing	Steel cylinder safety cell	
Capacity per cell	2.25 Ah	
Nominal voltage per cell	3.7 V	
Cell connection	7s48p	
Battery management system and safety		
Individual cell balancing	Yes	Increases lifetime of battery
High current and short circuit protection	Yes > 160 A for 2 s, > 200 A for 0.1 s, > 240 A for 1.5 ms	4-level safety cut-off mechanism to protect against overcurrent and short circuit
Deep discharge protection	Yes Cut off @ < 3.0 V per cell, Charge protection @ < 1.5 V per cell	
Protection against wrong charging	Yes	3 protection levels included in battery
Protection against wrong polarity connection	Yes	
Individual cell voltage monitoring	Yes	
Current Interruptive Device for each cell	Yes	
Safety vent for each cell	Yes	
Poly switch for each cell	Yes	
Cell temperature monitoring	Yes	
PCB temperature monitoring	Yes	
Auto-shut down in case of submersion	Yes	
Information system		
Interface	RS485	
Electronic battery identification	Yes	Important for connection of multiple batteries into battery banks
Datalogging	Yes	Important for warranty information

SOLAR CHARGER 45 W

*improved
2011 version*

CLEAN CHARGING WAS NEVER SO EASY

Electric outboards are ecologically advantageous in many ways. They are emission free in operation and they require a lot less energy to propel a boat.

But that is not all: Unlike gasoline outboards, electric outboards can also be operated completely from clean, renewable energy supplies such as solar power.

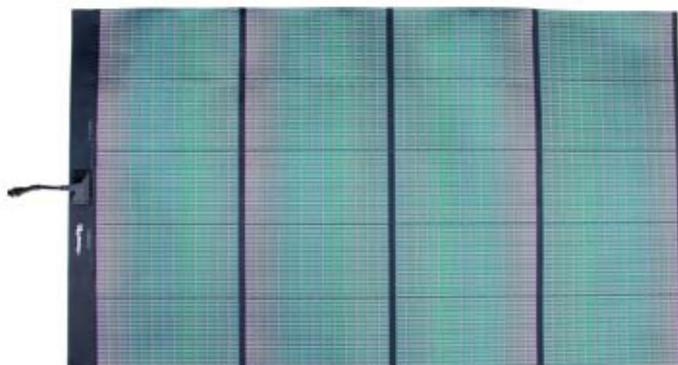
Thanks to Torqeedo's solar charge options, this opportunity has become not only ecologically advantageous but also extremely convenient and simple. Just plug the solar panel directly into your Ultralight or Travel 503/1003 battery and charge your battery wherever you want – even while operating your motor.

PowerFilm
SOLAR

To provide this option, Torqeedo has teamed up with renowned manufacturer of thin-film solar panels PowerFilm, Inc. PowerFilm's panels have endured rigorous submersion testing and are in our opinion the thin-film cells suited best for use in a marine environment.

KEY FEATURES

- Simple plug-n-play charging for Travel and Ultralight models
- Rollable with casing for easy transport and storage
- Extremely weatherproof: Successfully tested in full salt water immersion
- Extreme durability to match all conditions
- High efficiency performance even in low light conditions or when partially shaded.
- Environmentally friendly materials



— Ultralight models, Travel 503/1003 models



Unfolded _____ 147.3 x 91.4 cm

Rolled _____ 100.0 x 16.0 cm



— 1.27 kg



2-year
limited
warranty



SeaEagle SailCat with Travel 503 S and Solar Panel 45 W

Details

Output power: Under typical sun exposure in North America and Europe, output powers of 40-45 W can be expected

Cell type: Amorphous Silicon **Efficiency:** Cell Efficiency 7.0%, Module efficiency 5.5% **Voltage:** open circuit voltage 44 Volts **Charging time:** The 320 Wh battery of Ultralight and Travel 503 models will be charged in 8 hours from 0 to 100%; the 520 Wh battery of the Travel 1003 models will be charged in 13 hours from 0 to 100%. **Waterproof charging:** Connections between solar charger and Torqeedo batteries are completely waterproof to allow for safe charging during operation on the water without any risk for galvanic corrosion **Power Guarantee:** Limited warranty of 2 years refers to 80% of specified power.

ACCESSORIES

Product Group	Accessories				
ULTRALIGHT 403 	Spare battery Ultralight (320 Wh) 	Battery charger for Travel and Ultralight models 	Travel and Ultralight motor cable extension 	Travel, Ultralight and Cruise R throttle cable extensions 1.5 m/5 m 	Spare propeller v10/p350 
TRAVEL 503/1003 	Spare battery Travel 503 (320 Wh) 	Spare battery Travel 1003 / 503 (520 Wh) 	Solar panel 45 W 	Remote throttle (incl. 1.5 and 5 m connection cable) 	Travel, Ultralight and Cruise R throttle cable extensions 1.5 m/5 m 
	Travel and Ultralight motor cable extension 	Battery charger for Travel and Ultralight models 	Long tiller arm 	Spare propeller Travel 503 	Spare propeller Travel 1003 
CRUISE 2.0 (TILLER VERSION) 	Power 26-104 (requires additional charger and on/off switch, see below) 	Cable set extension 	Spare propeller v19/p4000 (more speed and efficiency, weedless design) 	Spare propeller v8/p350 (more thrust, lower speed and efficiency) 	
CRUISE 2.0 R / 4.0 R 	Power 26-104 (requires additional charger, see below) 	Twin-Cruise control set (requires two Cruise models) 	Spare propeller v19/p4000 (more speed and efficiency, weedless design) 	Spare propeller v30/ p4000 (high speed appli- cations, typically requires Twin-Cruise installation) 	Spare propeller v8/p350 (more thrust, lower speed and efficiency) 
	Cable set extension 	Travel, Ultralight and Cruise R throttle cable extensions 1.5 m/5 m 			
POWER 26-104 	Charger 350 W 	On/off switch Power 26-104 	Ask us for battery monitor displays 		

TECHNICAL DATA AND ORDERING INFORMATION

TECHNICAL DATA OUTBOARDS								
	ULTRALIGHT 403	TRAVEL 503 S/L	TRAVEL 1003 S/L	CRUISE 2.0 S/L	CRUISE 2.0 RS/RL	CRUISE 4.0 RS/RL	TWIN CRUISE 2.0	TWIN CRUISE 4.0
Input power in watts	400	500	1000	2000	2000	4000	4000	8000
Propulsive power in watts	180	220	480	1120	1120	2240	2240	4480
Comparable gasoline outboards (propulsive power)	1 HP	1.5 HP	3 HP	5 HP	5 HP	8 HP	8 HP	16 HP
Comparable gasoline outboards (thrust)	2 HP	2 HP	4 HP	6 HP	6 HP	9.9 HP	12 HP	20 HP
Maximum overall efficiency in %	45	44	48	56	56	56	56	56
Static thrust in lbs*	33	40	68	115	115	189	230	378
Integrated battery	320 Wh Li-Ion	320 Wh Li-Ion	520 Wh Li-Ion	No	No	No	No	No
Rated voltage in volts	28.8	29.6	29.6	24	24	48	24	48
Final voltage in volts	33.2	33.6	33.6	-	-	-	-	-
Total weight in kg	7.0	12.7 (S) / 13.3 (L)	13.4 (S) / 14.0 (L)	18.5 (S) / 19.0 (L)	16.8 (S) / 17.2 (L)	17.1 (S) / 17.5 (L)	35.1 (S) / 35.9 (L)	35.7 (S) / 36.5 (L)
Weight of motor without the battery in kg	4.5	8.9 (S) / 9.5 (L)	8.9 (S) / 9.5 (L)	-	-	-	-	-
Weight of integrated battery in kg	2.5	4.0	4.5	-	-	-	-	-
Shaft length in cm	45	59 (S) / 71 (L)	59 (S) / 71 (L)	62.5 (S) / 75.5 (L)	62.5 (S) / 75.5 (L)	62.5 (S) / 75.5 (L)	62.5 (S) / 75.5 (L)	62.5 (S) / 75.5 (L)
Standard propeller (v=speed in km/h @ p=power in watts)	v10/p350	v8/p350	v9/p790	v19/p4000	v19/p4000	v19/p4000	v19/p4000	v19/p4000
Alternative propeller options	-	-	-	v8/p350 (less speed, more thrust)	v8/p350 (less speed, more thrust)	v8/p350 (less speed, more thrust)	v8/p350 (less speed, more thrust)	v30/p4000 (more speed)
Maximum propeller speed in rpm	1200	700	1200	1300	1300	1300	1300	1300
Control	Remote Control Steering	Tiller Control	Tiller Control	Tiller Control	Remote throttle control	Remote throttle control	Remote throttle control	Remote throttle control
Steering	Provision for connecting to kayak rudder; lockable	360°; lockable	360°; lockable	360°; lockable	Provision for connection to standard remote steering; lockable	Provision for connection to standard remote steering; lockable	Provision for connection to standard remote steering; lockable	Provision for connection to standard remote steering; lockable
Tilting device	Manual with grounding protection	Manual with grounding protection	Manual with grounding protection	Gas ressure with spring assist	Manual with grounding protection			
Trim device	-	Manual, 4-step	Manual, 4-step	Manual, 5-step	Manual, 4-step	Manual, 4-step	Manual, 4-step	Manual, 4-step
Stepless forward/reverse drive	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated on-board computer with display	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

* Torqeedo static thrust measurement is based on globally valid ISO standards. Static thrust figures for conventional trolling motors are measured digressively, which results in higher values. In order to compare Torqeedo static thrust data with conventional trolling motors, add approximately 50% to the Torqeedo static thrust values.

ORDERING INFORMATION			
	Item #	Item	Description
ULTRALIGHT	1403-00	Ultralight 403	High efficiency kayak motor, 1HP equivalent with integrated 320 Wh lithium high performance battery, including charger, remote throttle control, GPS-based range calculation, information display, magnetic on/off pin and travel bag
	1413-00	Spare battery Ultra-light 403	High-performance lithium battery with integrated GPS receiver, 320 Wh, 29.6 V, 11 Ah
TRAVEL	1140-00	Travel 503 S	High efficiency outboard with integrated 320 Wh lithium high-performance battery, 1.5 HP equivalent, including GPS-based range calculation, built-in information display, and battery charger. Short shaft version.
	1141-00	Travel 503 L	As 1140-00 but with a long shaft
	1142-00	Travel 1003 S	High efficiency outboard with integrated 520 Wh lithium high-performance battery, 3 HP equivalent, including GPS-based range calculation, built-in information display, and battery charger. Short shaft version.
	1143-00	Travel 1003 L	As 1142-00 but with long shaft
	1144-00	Spare battery Travel 503	High-performance lithium battery with integrated GPS receiver, 320 Wh, 29.6 V, 11 Ah
	1145-00	Spare battery Travel 1003 / 503	High-performance lithium battery with integrated GPS receiver, 520 Wh, 29.6 V, 18 Ah
	1111-00	Spare battery Travel 401	High-performance lithium battery with integrated charge status display, 300 Wh, 14.8 V, 20 Ah
1112-00	Spare battery Travel 801	High-performance lithium battery with integrated charge status display, 300 Wh, 29.6 V, 10 Ah	
CRUISE	1205-00	Cruise 2.0 S	High efficiency and extremely powerful 24V motor, thrust comparable to a 6HP gasoline outboard. Includes 3 m cable set, 25mm ² , with fuse and main switch. Tiller operated, short shaft version
	1206-00	Cruise 2.0 L	As 1205-00 but with long shaft
	1209-00	Cruise 2.0 RS	High-efficiency and extremely powerful 24 V outboard, thrust comparable to a 6 HP gasoline outboard. Includes remote throttle control, magnetic on/off key, GPS-based range calculation, information display, 3 m cable set with 25mm ² , fuse, main switch and link arm to connect to standard steering systems, short shaft version
	1210-00	Cruise 2.0 RL	As 1209-00 but with long shaft
	1211-00	Cruise 4.0 RS	High-efficiency and extremely powerful 48 V outboard, thrust comparable to a 9.9 HP gasoline outboard. Includes remote throttle control, magnetic on/off key, GPS-based range calculation, information display, 3 m cable set with 25mm ² , fuse, main switch and link arm to connect to standard steering systems, short shaft version
	1212-00	Cruise 4.0 RL	As 1211-00 but with long shaft
	1217-00	Twin-Cruise control set	For twin applications of Cruise 2.0 R and 4.0 R models. Includes aluminum twin-throttle with dual motor display and 56 cm tie bar to connect the two motors.
OUTBOARD ACCESSORIES	1130-00	Solar Panel 45 W	Rollable solar panel, extremely weatherproof and specifically designed for marine use, plug-n-play connectors for waterproof charging with Ultralight and Travel 503/1003 models, including casing for easy transport and storage
	1901-00	Spare propeller v8/p350	For Travel 401, 801, 503 models, Base Travel, and Cruise Tiller models with serial number <5000
	1912-00	Spare propeller v10/p350	For Ultralight 402, 403 models
	1917-00	Spare propeller v9/p790	For Travel 1003 models
	1915-00	Spare propeller v8/p350	For Cruise R models, Cruise tiller models with serial numbers > 5000, slower speed, lower efficiency, higher thrust
	1916-00	Spare propeller v19/p4000	For Cruise R models, Cruise tiller models with serial numbers > 5000, higher speed, lower thrust, weedless design
	1923-00	Spare propeller v30/p4000	For Cruise R models, Cruise tiller models with serial numbers > 5000, for high speed applications, typically requires Twin Cruise 4.0 installations
	1918-00	Remote throttle for Travel 503/1003	Allows running Travel 503/1003 models with a remote throttle, including built-in display providing information on battery status, GPS-based speed and remaining range, including 1.5 m and 5 m connection cable between motor and throttle
	1919-00	Long throttle arm	Longer tiller handle, 60 cm, for Travel 503/1003 models (available May 2011)
	1920-00	Travel and Ultralight motor cable extension	Extension for cable connection between battery and motor for Ultralight 403 and Travel 503/1003 models, allows for longer distance between battery and motor, 2 m long, with waterproof connectors (available May 2011)
	1921-00	Throttle cable extension 1.5 m	Extension cable connection for Travel 503/1003, Ultralight and Cruise R models; allows for longer distance between tiller or throttle and motor/battery
	1922-00	Throttle cable extension 5 m	Extension cable connection for Travel 503/1003, Ultralight and Cruise R models; allows for longer distance between tiller or throttle and motor/battery
	1204-00	Cable set extension for Cruise models	Extension for Cruise cable-set, 2 m long, with high current plugs
POWER	1127-00	Battery charger for Travel 503, 1003 and Ultralight 403 models	40 watt charger (12 V, 3.3 A), for power outlets between 100-240 V and 50-60 Hz
	1113-00	Battery charger for Travel 401	40 watt charger (20 V, 2 A), for power outlets between 100-240 V and 50-60 Hz
	1114-00	Battery charger for Travel 801	80 watt charger (40 V, 2 A), for power outlets between 100-240 V and 50-60 Hz
	2103-00	Torqeedo Power 26-104	High-performance lithium battery, 2,685 Wh, rated voltage, 25.9 V, charge 104 Ah, weight 20 kg, including battery management system with integrated protection against overcharge, short circuit, deep discharge, wrong polarity connection, overtemperature, and submersion, waterproof IP 67
2206-00	Charger 350 W for Torqeedo Power 26-104	Charge power 350 W, charges Torqeedo Power 26-104 in 11 hours from 0-100%, waterproof IP 65	
2304-00	On/off switch Torqeedo Power 26-104	Switch to activate and turn off Power 26-104, IP67, with LED indicator displaying on/off status, required if Power 26-104 is used without Cruise R outboards.	

TORQEEDO

STARNBERG.GERMANY

Your Torqeedo retailer

Torqeedo United Kingdom

T +44 1502 516224
F +44 1502 516224
uk@torqeedo.com

Torqeedo Germany, Austria, Switzerland

T +49-8151-268 67-0
F +49-8151-268 67-19
info@torqeedo.com

Torqeedo France

T +33-(0) 240 01 06 04
F +49-8151-268 67-19
france@torqeedo.com

Torqeedo North America

T +1-815-444-8806
F +1-815-444 8807
USA@torqeedo.com

All other countries

Torqeedo GmbH
Petersbrunner Str. 3a
82319 Starnberg
T +49-8151-268 67-0
F +49-8151-268 67-19
info@torqeedo.com

www.torqeedo.com

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