

Wilderness Systems Helix MD™ Motor Drive Fact Sheet

FACT: The state-of-the-art Helix MD Motor Drive is not a trolling motor.

The Helix MD Motor Drive is the first motor drive to be designed specifically—from shaft, to prop, to gearing, to battery—to propel a kayak. And thanks to its unique lithium battery and optimum torque, the Helix MD is substantially more powerful, smaller and lighter than trolling motors.

Trolling motors are designed to move heavy fishing boats very, very slowly—and have been somewhat adapted to fit on kayaks— however you still have to deal with that heavy and clunky battery.

The Helix MD has equivalent propulsive power to a one horsepower gas outboard. The Torqeedo 403 system used in the Helix MD is the carefully-selected, high-quality gearing system that provides this power through optimum torque. Propellers are most efficient when they are moved slowly, but powerfully (low rpm, high torque). The Torqeedo 403 system uses planetary gears to achieve the high torque required to spin the efficient prop slowly, and they are quiet but not silent. Because of this technology the Helix MD is a much more efficient performing system that allows for a longer runtime and more power with an equivalent battery supply of a trolling motor. A trolling motor is a direct drive (shaft is connected directly to the rotor), so it is marginally quieter but less powerful and requires a much heavier battery.



FACT: Multiple factors—including current, wind speed, capacity and motor speed—affect Helix MD’s battery life.

The following chart should be used as a baseline, but keep in mind the variables that may affect battery life:

	Speed in MPH	Range in miles	Run time in hours
Slow Speed	2.6	21.8	8:20
Half Power	3.7	15.5	4:10
Full Power	5.8	4.6	0:48

	Speed in km/h	Range in km	Running time in hours
Slow Speed	4.2	35.2	8:20
Half throttle	6	25	4:10
Full throttle	9.3	7.4	0:48

Adverse or changing conditions on the water can impact any motor’s achievable range. If you’re operating in high winds or strong currents your motor will have to draw more power to overcome the conditions and your displayed range will decrease (faster). Additionally, the boat design and the load you are carrying can affect your speed and range.

When travelling through water, displacement increases power required in proportion to the cube (third power) of the speed. This means that doubling water speed increases the power required eightfold. The faster you go, the more power you consume.

Conversely, it of course also means that only a slight reduction in speed will increase the range attainable significantly. Simply reducing speed by half a knot has a considerable effect on the remaining range.

Since mental arithmetic to the power of three is quite tricky, the on-board computer of the Ultralight constantly calculates the remaining range for you. To do this, it combines the consumption data from the motor with the charge level of the batteries together with the speed over water obtained via GPS. This means you can read the remaining range in real time from the display on the throttle. Purchasing the TorqTrac App will allow you to even read the remaining range from a map on your smartphone.

Multiple factors—current, wind speed and motor speed—affect battery life. Your motor, for example, draws more power when you're fighting a current in 15-knot winds. Adverse or changing conditions on the water can impact any motor's achievable range.

- **Tip:** Keep a close eye on the remote throttle display when in more challenging conditions to gauge its battery status.

FACT: Torqeedo lithium batteries are safer, more efficient, more powerful and lighter than the alternative. They're even buoyant!

Torqeedo makes the safest lithium batteries on the market, with individually-welded safety cells and a state-of-the-art management system. Lithium batteries store significantly more energy than all other batteries so they weigh much less. The battery weighs 6 lbs. including casing, electronics and cells, compared to lead-acid/trolling batteries that can weigh between 40 and 90 lbs.

Lithium batteries maintain a high current—a major advantage because you have the same level of power available the whole trip, whether your battery is 95% or 5% charged. That can really help when fighting a current coming home. Lead-acid/trolling motors start losing power at about 50% discharge. Lithium batteries last much longer: 6-10 years with recreational use. They also have no memory effect, so there is no need to fully charge and discharge to maintain capacity. If you only use 20% of your capacity, you can go ahead and top off the battery so it is full for the next trip without worrying.

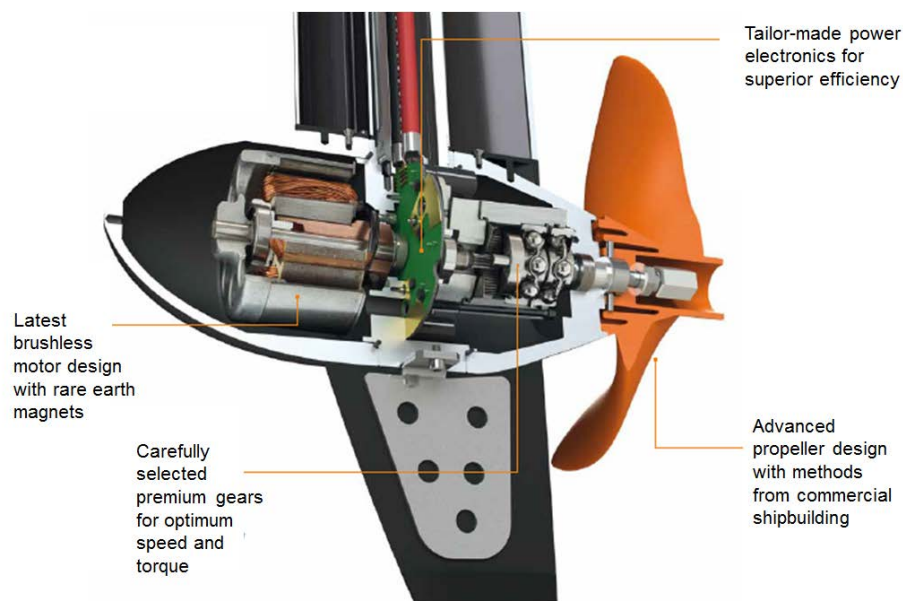
FACT: Charging the lithium battery from 0% to 100% will take 12 hours to complete and it has no memory effect on partial power.

During the charging process the controller contained in the battery controls the charging current. The controller protects from fully discharging and overcharging. Therefore you can connect the battery to the charger without worrying.

Lithium batteries last from 6-10 years with recreational use. The battery is equipped with high performance lithium ion batteries. The cells have a self-discharge of less than 1% per month at 20°C (68°F) and have stable cycles. The lithium battery can be used in temperatures from -20°C to +60°C (-4°F to +140°F). They also have no memory effect, so no need to fully charge and discharge to maintain capacity. If you only use 20% of your capacity on a trip, you can go ahead and top off the battery so it is full for the next trip without worrying that you're hurting your battery. This is a huge advantage over Lead-acid/trolling motors that start losing power at about 50% discharge and are temperamental when it comes to charging.

You can extend the lifespan of your battery if you do not expose it to hot environments for longer than necessary. A cool environmental temperature is particularly important for longer storage. For longer battery storage periods you should follow these rules. Storage for around six months: Charging level when stored 50%: Storage for a whole year: Charging level when stored 100%: If the battery is to be stored for several years the battery should be charged once a year in order to prevent the battery from completely discharging.

Here is what the Helix MD Motor Drive technology and hardware looks like from the inside out:



Tailor-made power electronics, a brushless motor, advanced propeller design, and premium gears all translate into a highly optimized system that supplies superior propulsion and performance!

FACT: Propulsive power of the Helix MD delivers efficiency and speed.

Trolling motors are rated in pounds of thrust, which is an inadequate measurement of how well a motor does its job. Propulsive power, a much more useful piece of data which tells you how well a motor actually moves a boat, is calculated by multiplying speed times thrust. If you reduce speed to zero by pulling on an immovable object, as is done with standard static thrust measurements, this calculation will always result in a zero and won't tell you anything about how the motor will perform in the real world.

The motor used in the Helix MD was designed to efficiently propel a kayak, not a heavy fishing boat, and was engineered to deliver a low thrust (high thrust is not necessary to move a kayak) and higher speed. The motor was rated at 33 lbs. of thrust based on internationally accepted ISO standards. Static thrust figures for conventional trolling motors are measured differently, with a method that usually results in higher values. To compare Torqeedo static thrust data with trolling motors, add approximately 50% to the Torqeedo static thrust values. If you are comparing trolling motors against other trolling motors - or using your kayak to pull against a wall - then static thrust may be a good way to compare power ratings. If not, we should keep looking.

Combustion engines are usually rated in horsepower, which is also a flawed measurement. Horsepower ratings measure the power at the prop shaft, (torque x angular velocity), a method that does not take into account the efficiency of the propeller and how well it moves water to propel the boat. In small engines, the shaft power rating can be up to 80% higher than the actual propulsive power. Just like with trolling motors and static thrust, shaft power - rated in horsepower - is an okay way to compare gas engines with each other but not terribly useful otherwise.

Torqeedo uses propulsive power to measure its motors because you buy a motor to move your boat, not to spin an empty prop shaft or pull on a wall. But, since most people are familiar with horsepower ratings, Torqeedo provides an equivalent rating based on propulsive power. The motor used in the Helix MD delivers the same propulsive power as a one horsepower gas outboard and moves kayaks more efficiently and powerfully than any other system on the market.

FACT: The smart, integrated display on the throttle shows information on the status of the battery, GPS-based calculation of speed and your remaining range.

It is important to pay attention to the feedback the throttle display is reading. Environmental conditions, boat design, and your carry capacity can all impact your motor's achievable range. Monitoring your battery life and range will ensure that you have the optimal experience and can prevent you from overextending capabilities.

You can customize how the throttle displays information for you:

- Use the "setup" button to set the units for the display. You enter the menu by pressing the "setup" button for 3 seconds.
- First you can select the units in which the remaining range is displayed. Press the middle button to select between kilometers, American miles, nautical miles, and hours. You confirm your selection by pressing "setup" again.
- You then enter the speed indicator setting. You can choose between kilometers per hour, miles per hour, and knots. The selection is made again by pressing the middle button. You confirm your selection by using "setup" button again.
- The final setting is for battery charge life. You can choose between percentage and voltage by pressing the center button. You confirm your selection and leave the setup menu again by pressing the "setup" button again.

Throttle Error Codes & Troubleshooting

Occasionally you may receive an error code reading on the throttle display. We have included a full table of error messages and resolutions in the owner's manual. Here are a few of the more common error messages that you might see:

E30: Motor Communication Error

Resolution: Check motor cable connection or check cable for damage

E32: Throttle Communication Error

Resolution: Check throttle cable connection or check cable for damage

E33: General Communication Error

Resolution: Check cable connections or check cables for damage

- **E33 Troubleshooting tip:** Cable communication errors can sometimes be resolved by blowing out or drying off the cable connection pins on the end of the cable or the connection ports on the battery.

E45: Battery Overcurrent

Resolution: Switch motor off and then turn on again

- **E45 Troubleshooting Tip:** The E45 error means that the battery is complaining that the motor is pulling too much power. To protect the system, the battery turns the system off and displays the error code E45.

There are several different causes of a battery overcurrent. If a user gets something stuck in the propeller or if the propeller hits an object it can result in an E45 error. Or if a customer changed from very fast forward to reverse, the motor will overshoot that power limit resulting in an overcurrent. Generally turning the unit off and on again will resolve the issue. If the error continues for some reason then you will need to consult customer service.

FACT: The Propeller Alignment System offers easy installation and removal.

The Propeller Alignment System was designed to help you remove the Helix MD from the FlexPod OS scupper of the kayak. The footprint of this scupper is narrow and the propeller needs to be in a vertical position so the motor drive can be lifted up and out of the kayak. When you turn off the power of the Motor drive, the propeller is not going to stop in a vertical position every time. The Propeller Alignment System will help you to align the propeller to a vertical position.

While the Helix MD is still fully deployed in the pod scupper, locate the orange pull ring on the right side of the housing lid. Pull up smoothly until it stops and release it down so the swing arm is up and down in one fluid motion. You do not want to yank on the cord. Unlatch the Helix drive from the pod and slowly remove the unit. If the propeller did not align properly, reseal the Helix MD in the pod and try again.

- **Troubleshooting tip:** There is a dead spot in the propeller positioning where the swing arm is ineffective. Occasionally, the propeller will align in this position. The unit simply needs to be reseated or powered up for a second to help reposition the propeller. This should resolve it the next time.

FACT: You can prolong the life of your Helix MD with proper care and maintenance.

After use, always take the motor out of the water and wash all exterior and interior components in fresh water, particularly after operation in salty or brackish water. Remove the drain plug and thoroughly flush the system with fresh water from the top of the lid and let it drain out from the bottom. Every two months, use contact spray to care for all electronic contacts points on cables and the battery. After 5 years of operation the shaft sealing ring must be exchanged. Please contact an authorized Service Center for replacement sealing ring.

Helix MD Motor Drive Specifications:

Brand: Wilderness Systems

Product Name: Helix MD™ Motor Drive

***Price:** \$1,999 USD, \$2,239 CAD

**Price includes: motor, battery, remote throttle and charger. Solar charger sold separately.*

Dimensions:

Length: 11.5"

Width: 11.75"

Height: 28.85"

Weight: 15 lbs

Features*:

Range: approximately 20 miles

Max Speed: 6 mph

Battery Life: up to 8 hours

**dependent on conditions (i.e. current, wind speed, capacity and motor speed)*

Please visit the following links for [Video](#) and [Photo](#) assets.

Site Links:

Helix MD Motor Drive [Product Site](#)

Wilderness Systems [Brand Site](#)

Compatible Wilderness Systems Kayaks:

[Tarpon 130X](#)

[A.T.A.K. 140](#)

[Thresher 140](#)

[Thresher 155](#)



About Wilderness Systems

Innovative and award-winning designs, premium outfitting, and an uncompromising attention to detail have made Wilderness Systems an industry leader since 1986. Today the brand continues to push the limits of technology, performance, comfort, responsiveness and aesthetics. Taking that same drive into the angling market with high quality fishing kayaks, Wilderness Systems now offers the ultimate on-the-water experience for everyone from passionate anglers to recreational boaters and expedition paddlers. Explore Wilderness Systems, part of the Confluence Outdoor family of made in the USA brands, at www.wildernesssystems.com.

About Torqeedo

Torqeedo was founded in 2005 and has grown to be the industry leader with more than 60,000 motors currently in the field. They manufacture electric propulsion systems from one to eighty horsepower equivalents in a state-of-the-art facility outside Munich, Germany. Torqeedo products are industrially engineered and produced, fully waterproof and are powered by lithium batteries specifically designed for safety and to stand up to the marine environment. <http://www.torqeedo.com/us/en-us>