

SHAFT MOTOR



No hub motor. No middle motor. Protanium makes a revolution for electric bicycles With a completely new motor concept! A shaft drive motor system. The Protanium shaft motor.

A shaft drive as a driving force on bicycles.

Protanium shaft motor is based on a shaft drive. Shaft drive propulsion has existed since 1890. Among the many benefits of a shaft drive bicycle is that it eliminates the chain and sprockets both of which require regular service and replacement. The shaft drive also ensures a high efficiency throughout the life of the bicycle apposed to a chain with only a high efficiency when adjusted, new and clean. The shaft drive requires no maintenance and is much stronger than any chain. A shaft drive is in contrast to a chain: without any oil and dirt.

Shaft drive and motor in one complete unit

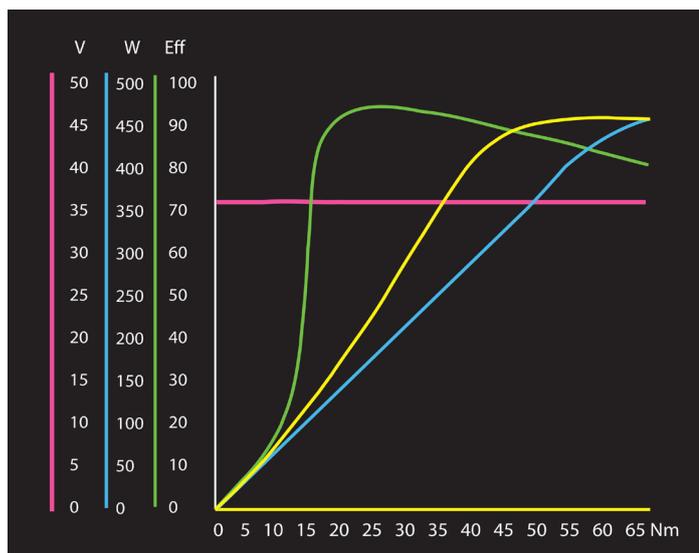
The Protanium shaft motor is almost like a normal shaft drive and an electric motor built together so that the rider and the motor draws on the same axle for optimum traction and weight savings. Through a set of internal clutches the cyclist will not feel any resistance from the engine when the system is off. The feeling will be like riding a normal bicycle without a motor. The internal mechanical clutches are also arranged so that when the cyclist pedals backwards no resistance is given from the motor. This means that Protanium shaft motor is perfect for coaster brake.

The controller are also built into the unit.

The Protanium shaft motor is offered as "one-unit" with the motor controller built in. The system is equipped with a double planetary gear system which gives an exceptionally high torque. In addition, the device also includes two optical sensors: OSRAM. These sensors acts as a speed sensor and a torque sensor. With these sensors we achieve the same purpose as the mechanical clutches and therefore a double security built into the motor system, in order to ensure the rider's safety. Safety is not only dependent on an electronic solution but also has the mechanical solutions as a back up. With optical sensors, we can dispense the motor assist exactly where the rider would rather have it, namely when start pedaling and going up hills. By dispensing the power in this thoughtful way we can conserve battery power and have an unusually high degree of power assistance.



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Many oportunities

We offer bicycle manufacturers flexibility to specify their wishes if they differ from the standard. By order and agreement about development costs, we can offer the shaft motor to various voltages, power, torque and speed.

European service center for the shaft motor

The service center is placed in the Netherlands:

Protanium Motor Service center Europe
 Johannushof 30,
 6545 BA Nijmegen,
 The Netherlands
 Office: +31 642050166

The shaft Motor controller

The Protanium shaft motor has the motor controller built into the system in the standard version. By placing the motor controller along with the other parts of the shaft motor we achieve to have almost all components for the electric bike in one unit: motor, normal drive line, speed and torque sensor, and now also the motor controller. This means that the bicycle would appear very clean without many cables. It also has the benefit that the system is quick to mount when mounted in a bicycle factory.

Specification display:

9 Levels assist, Speed, distance, Battery indicator, light, system, error codes etc.



The display

The system is controlled from the handlebar by Protanium's digital display. The display is removable and also functions as a key for the bicycle. The display shows battery capacity, speed, distance and even error codes for the system if an error occurs. The display has 9 different assist levels.



Motor invention by Höhl & Munksö

The new shaft engine was invented and developed by Höhl & Munksö. The engine has been three years in development and is ready for presentation at The Eurobike show in late August this year.

Specifications:

Nominel Voltage:	36V
Nominel Power:	250W
Max effect:	540W
Max Torque:	63Nm
Max Efficiency:	92 %
Nominal motor speed:	RPM 3000
Max. motor speed:	RPM 4000
Service Life in average:	Hrs: 10.000
Water proof rating on electric system:	IP64
Operating Temperature °C:	-20°C ~ + 100°C
Mounting Position:	Vertical
Weight:	> 4 kg.
Battery:	36 Volt, 11,6 Ah

Specifications can change without notice.

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