

Testreport 2006

Pedelec / E-Bike-Test 2006



Assistance Factor and Mountain Range

A worldwide unique test with live test rides over two different test routes and with the latest measuring equipment. Conducted by Frieder Herb and Kerstin Bunte, ExtraEnergy, in Kirchheim/Teck, Germany.

Battery

- Charge-discharge cycling: Charge with original charger, discharge with electronically controlled discharger.
- Solder measuring cable onto the battery cells to measure electricity flow during the test.



Bicycle

Each test bike was equipped with the following

- Handlebar bag with tools and an on-board data collector and transformer
- Palm-Computer for recording speed, pedaling rate, and pedaling power
- Special pedals to measure the exact amount of the rider's muscle power. The data was transferred via radio to the on-board computer
- Sensors to measure pedaling rate and speed
- Cycloport Hack-4 for pulse measuring



Further steps

- Calibrate pedals with a comparison weight
- Attach cables
- Check tire pressure
- Set the Palm-computer for the corresponding wheel circumference



Der Farradtest

Everyday Track

The 5 miles long route in Kirchheim/Teck is mostly flat and has a short incline up to 8%. Here, motor assistance factor was measured.

Mountain Track

The 1/3 miles long route begins with an 8% incline and then decreases into a 7% incline. Here, assistance factor and mountain range were measured.

Measuring Assistance Factor

Formula developed to calculate the assistance factor:

$$ub(v_{ped}, mL_{ped}) := \frac{1}{38.686 \cdot v_{ped} - 76.972} - 1$$

$$ue(v_{ped}, mL_{ped}) := \frac{1}{1.049 \cdot v_{ped}^2 - 25.132 \cdot v_{ped} + 238.42} - 1$$

Glossary

ub = Assistance factor on hills

ue = Assistance factor on the flat

vpe = Speed of pedelec/e-bike in kilometers per hour (km/h)

lpe = Rider's muscle power on pedelec/e-bike in Watts (w)
(Abbreviations based on German explanations)

Measuring Mountain Range

On the mountain track, riders rode uphill until the battery was empty (downhill the riders coasted).

Evaluation

After each test was completed, the data (speed, power and pedaling rate) were downloaded from the Palm-computer to a PC, and evaluated.

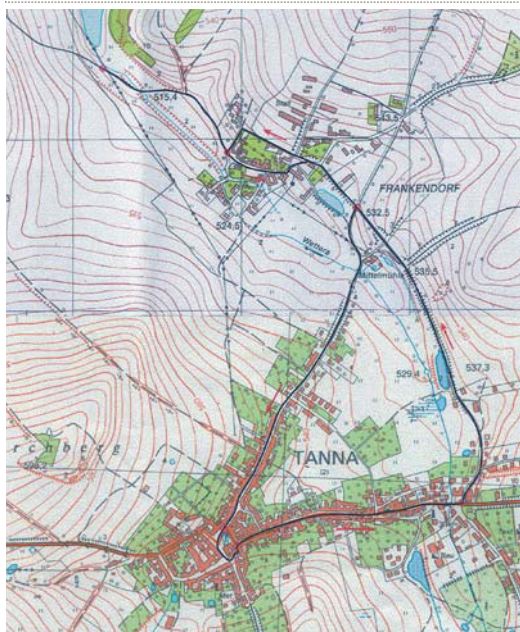
Pedelec / E-Bike-Test 2006



Everyday Test in Tanna, Thuringia

Six test riders aged between 26 and 52 years rode 12 pedelecs and 1 e-bike over a test track through the city of Tanna and the surrounding countryside. They did more than 3200 km in two months.

Map



Route

The test route through Tanna city and the surrounding countryside is 7.8 km (4.8 mi) long. The course includes smooth and rough riding surfaces as well as small hills up to 6% grade. In order to simulate the everyday use of a pedelec a little better, the test riders stopped at three different places during each round. Five test riders rode each bike over the set track until the battery was empty. They chose the motor assistance mode they liked best; uphill most of them preferred the highest assistance possible.

Test Track Tanna: 4.8 miles km through Tanna City and surrounding countryside



The Test Team in Tanna (from left to right): Klaus Springer (test rides), Hannes Neupert (management test and exhibition, test rides, test reports), Anette Rauh (test rides), Martin Springer (test rides, maintenance), Heike Zschächner (test rides), Daniel Hoppe (test rides).

Not in the picture: Moritz Grünke (test report design), Susanne Bruch (web presentation, photos), aktiv Radfahren (product photos), Sebastian Mullauer (design and construction management of exhibition displays), Patrick Knappick (construction of exhibition displays).

T8 Premium

FLYER Biketec AG



With Flyer T8 Biketec has redefined the limitations of today's technical possibilities.

The sporty appearance is not misleading, this bike feels like a good 28" trekking-bike with wings attached.

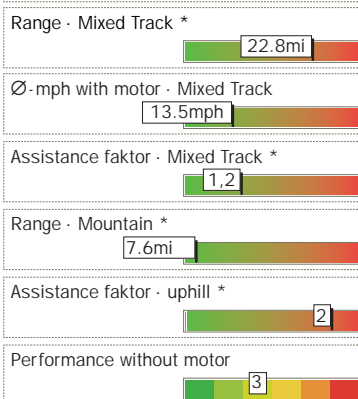
Biketec has combined the latest Panasonic drive engineering with a Shimano 8-speed hub gear and has developed an electronic circuit for the light, providing lighting even after turning off the engine.

Our advice: If you want to ride a similar engineering but feel intimidated by the price, take a closer look at the models from the C-series starting from 1000 Euro less.

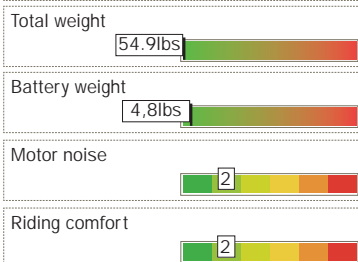


The elite is gathered here: Speedlifter, Shimano 8-shift hub gear and electronic operation unit with built-in capacity indicator
The latest electric drive from Panasonic employs a small battery with big capacity.

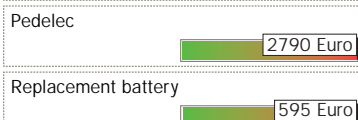
Riding Performance



Specifications and Ratings



Price



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Small weight provides easy riding even without motor
- + Very high-quality and comfortable equipment

- Pedals slippery when wet
- No light without battery

Address
FLYER Biketec AG
Industrie Neuhof 9
CH-3422 Kirchberg
Switzerland
Tel: +41 34 448 60 60
info@flyer.ch
www.flyer.ch

Components/ Accessories

Very high-quality bicycle components, Shimano 8-speed gear shift, hub brakes, U-lock, air-pump, light off the battery, separate charger, Lithium battery, 2 years battery warranty, easy-to-use user manual, frame sizes: 41, 45, 50, 55 cm; cruiser style also 60 cm



Falt-FLYER (Foldingbike) app. 1999 Euro



FLYER C3 plus app. from 1790 to 1940 Euro



FLYER C8 Premium 2490 to 2690 Euro

Emove Tourer RT



Hercules Fahrrad GmbH & Co. KG

In detail a convincing pedelec, that perfectly disguises its intrinsic values as a bike.

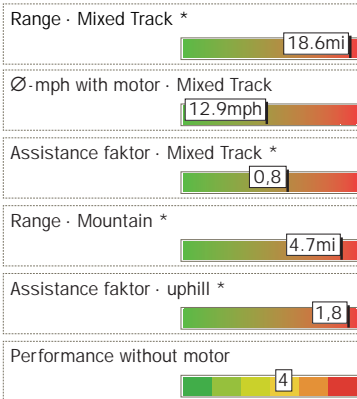
Under the name Emove, Hercules offers pedelecs with invisible and silent, yet noticeable motor boost. The engineering, developed by the sister company Sparta, was leader of the European market in 2004 and 2005. Since 2006 the Sparta pedelec is available in Germany under the trade name Hercules. Thus resuming a 100-year tradition of the Hercules brand in the field of light electric vehicles.

Emove Tourer RT and other Emove models are characterized by hiding the batteries in their frames as well as their silent hub motor. With all models the steering unit is situated in an easily operated bike computer.

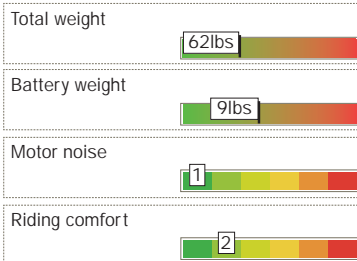


On first glance a bike computer, in fact the key to electric drive, capacity display, light appliance, fault analysis etc. The engineering being mostly identical with Sparta, Hercules has added a useful saddle bag.

Riding Performance



Specifications and Ratings



Price



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

** The given ranges were calculated mathematically because the tested bike used a 9 Ah battery and the latest model with 10 Ah has just recently entered test. 10 % were arithmetically added to the actually measured data. These were: Mixed Track 27 km, mountain 6.9 km. The calculated data will be reviewed with the new model, soon.

- + Outstanding service interface: the dealer can immediately analyze problems by means of the on-board computer and adapt the settings to the customer
- + Absolutely noiseless motor
- The battery cannot be removed from inside the frame for charging

Address
Hercules Fahrrad
GmbH & Co. KG
Industriestr. 32-40
90616 Neuhof a. d. Zenn
Germany
Tel: 09107-923-0
info@hercules-bikes.de
www.hercules-bikes.de

Components/ Accessories

High-quality bicycle components, Shimano derailleur, front hub brake, coaster brake, U-lock, air-pump, light off the battery, (when the battery is empty, the motor functions as dynamo), NiMhd battery, 2 years implied warranty, separate charger, good user manual, frame sizes: 46 , 50, 55 cm; man's frame: 50, 54 and 59 cm



Emove Tourer 1949. - Euro Mens style frame blue- silver with rim brakes and 10 Ah battery



The Emove Comfort RT sells for 1999. - Euro uses a 9Ah Battery and features a coaster brake



By adding the compatible pannier mounted Battery from Sparta the range can be doubled 9 Ah: 399 Euro 10Ah 425 Euro

eZee Sprint

Shanghai eZee Kinetic



Recommended for being by far the strongest pedelec within this price category! Thanks to powerful motor and high assistance factor, eZee Sprint has lived up to its name.

eZee was the biggest surprise of the 2006 Test. Regarding electric performance it deserved a "very good" without doubt. Its integrated error detection device for electric components is outstanding. Among its high-quality components are the Shimano hub gear shift and the tires. Unfortunately, the picture is clouded by parts employed for bearings, lighting, chain wheel and kick stand which are below the overall quality level of the Sprint pedelec. However, we assume that eZee will soon make improvements. For buyers looking for a strong pedelec and want to install higher-quality bike parts themselves, eZee is certainly the right choice.



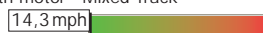
The big saddle led to very varied opinions among test riders. Great enthusiasm on one side and explicit rejection on the other side. Stand and chain ring were clearly rusting after only two months of test riding due to insufficient coating.

Riding Performance

Range · Mixed Track *



Ø-mph with motor · Mixed Track



Assistance faktor · Mixed Track *



Range · Mountain *



Assistance faktor · uphill *

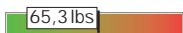


Performance without motor

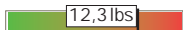


Specifications and Ratings

Total weight



Battery weight



Motor noise



Riding comfort



Price

Pedelec



Replacement battery



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Strong motor assistance uphill
- + Low center of gravity

- Voltage-based battery capacity indicator inaccurate

Address
Elektrisches Fahrrad
Naumannstr 2a
98693 Ilmenau
Germany
Tel: +49/(0)36 77 46 39 56
info@elektrisches-fahrrad.de
www.elektrisches-fahrrad.de

Components/ Accessories

High and low-quality bicycle components, Shimano gear shift, Tektro V-brake in the front, hub brake in the rear, lock, separate air-pump, dynamo light, separate charger, NiMhd battery, 6 months battery warranty on 80% remaining capacity, user manual, frame size: 43 cm.



eZee Cadence app. 1500,- Euro



eZee Chopper app. 1400,- Euro



Quando I app. 1100,- Euro

eGo Vehicles, Inc.



Helio, a great concept, mix between a bike and a scooter. Good engineering for a good price.

Helio is the consequential E-Bike, as it no longer has pedals but a bigger battery and a stronger motor. It indicates a development towards no pedaling, as opposed to a pedelec. Despite high average speed and rapid acceleration, the felt speed was considerably slower than with pedelecs- added pedaling clearly boosts felt speed.

With Helio the motor is controlled with a throttle, allowing smooth acceleration and deceleration.



The throttle allows electric acceleration as well as effective deceleration, and also enables energy recuperation. The voltage-based capacity indicator and the main switch are integrated into the aluminium frame. Unfortunately, the remaining range can only be estimated with some experience.

Riding Performance

Range · Mixed Track *	23.6mi
Ø · mph with motor · Mixed Track	12.5mph
Assistance faktor · Mixed Track *	
Range · Mountain *	6.6mi
Assistance faktor · uphill *	
Performance without motor	

Specifications and Ratings

Total weight	136.9lbs
Battery weight	52.9lbs
Motor noise	3
Riding comfort	2

Price

Pedelec	1690 Euro
Replacement battery	190 Euro

* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Easy to use and comfortable
- + Effective motor brake
- Voltage-based battery capacity indicator inaccurate
- Hard to move when the battery is empty

Address
solar und mobil GmbH
Ludwig-Erhard-Str. 9
64653 Lorsch
Germany
Tel: +49 (0)62 51/58 82 45
helio@solar-mobil.de
www.egovehicles.de

Components/ Accessories

Quality bicycle components, quiet rim drive, V-brakes in the rear, disc brakes in the front, anti-theft protection by turning the main key, no air-pump, good lights off the battery, Lead battery, 6 months battery warranty, good user manual. Optional: trailer, quick charger, rain protection. Universal frame size.



HELIO 37 km/h, 1.690,- Euro



HELIO S-Version 37 km/h, 1.790 Euro



Solar+Mobil offers as well the Twike -a muscle electric vehicle street legal as a Car PKW for two persons. Price 16-20 000 Euro depending on the battery capacity

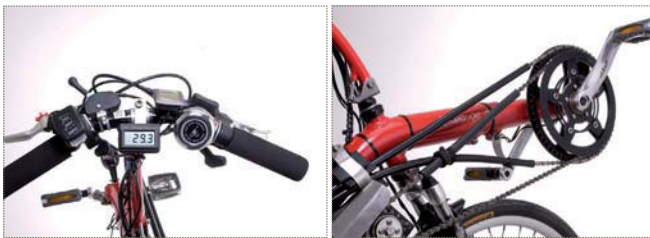
Mistral-E

Lohmeyer Leichtfahrzeuge GbR

Recommended for being the fastest and strongest pedelec. Perfect for individualists covering long distance on a daily basis and not afraid of engineering.

A few years ago in Europe unthinkable, today it is legal: a pedelec assisting up to 50 km/h (31 mph). With a vehicle as expensive as this, it is rather comforting to have the required insurance plate, allowing theft insurance.

Here, Lohmeyer offers the drive together with the Mistral recumbent bike by Challenge, however, on demand it can be fit into any other special bike. Due to high speed and enormous assistance, energy usage is very high. It is possible to triple battery capacity and use a quick charger to recharge as much as possible during short breaks.



The handlebar is packed with operating devices. Mid the digital voltage indicator. The forceful drive comes from a second chain that connects the motor with the bottom bracket. It is therefore very time-consuming to adapt to different body sizes.

Riding Performance

Range · Mixed Track *

10.4mi

Ø-mph with motor · Mixed Track

20.8mph

Assistance faktor · Mixed Track *

5,0

Range · Mountain *

4.2mi

Assistance faktor · uphill *

5,9

Performance without motor

3

Specifications and Ratings

Total weight

59.5lbs

Battery weight

6.2lbs

Motor noise

3

Riding comfort

3

Price

Pedelec

4495 Euro

Replacement battery

520 Euro

* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Once used sitting on a recumbent, it is very comfortable
- + Extremely strong motor and high speed
- + The range can be doubled with a second battery
- Complicated to adapt to different body sizes (chain length has to be changed)

Address
Lohmeyer
Leichtfahrzeuge GbR
Geistinger Str. 31
53773 Hennef
Germany
Tel: +49 (0)22 42/825 84
+49 172/592 94 56
d-Lohmeyer@gmx.de
www.leichtfahrzeuge.de

Components / Accessories

Quality bicycle components, Sram Dualdrive gear shift, Magura hydraulic brakes (disc brake in the front, rim brake in the rear), no air-pump, no lock, light off the battery, separate charger, Lithium battery, 6 months battery warranty, easy-to-use user manual, one highly adaptable frame size.



Anthrotech-E, 3735,- Euro



Alleweder-E custom made prices start at 5105,- Euro
NimHd 8 Ah Battery upcharge for Li-Ion 11 Ah 180,- Euro



power kit: 1320,- Euro

Schachner GmbH

Test not yet finalized. The Schachner citybike stands out with a powerful and quiet motor.

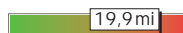
Unfortunately, the testing of the Schachner city bike has not yet been completed and no final evaluation can be given. As soon as the weather allows it, tests will be completed and test results will be published.



The operation of the large cockpit with built-in motor control unit is not self-explanatory. The Schachner motor wins over with plain compactness, a forceful yet smooth drive and quiet riding performance.

Riding Performance

Range · Mixed Track *



Ø-mph with motor · Mixed Track



Assistance faktor · Mixed Track *



Range · Mountain *



Assistance faktor · uphill *



Performance without motor

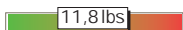


Specifications and Ratings

Total weight



Battery weight



Motor noise



Riding comfort



Price

Pedelec



Replacement battery



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

** Due to a defect, only 3 of 6 test rides could be completed. The given data are not the final ones.

- + Strong motor assistance uphill
- + Low-priced pedelec

- At higher speeds the frame vibrates due to the high battery weight on the rear rack and soft frame construction

Address

Schachner GmbH
Gewerbepark Pöllau 6
3353 Seitenstetten
Austria

Tel: +43/747 74 29 73

office@elektrobikes.com

www.elektrobikes.comdrive

Components / Accessories

Quality bicycle components, Sram gear shift, rim brakes, U-lock, air-pump, simple dynamo light, separate charger, NiMhd battery, 1 year battery warranty + 1 year implied warranty, no user manual, frame sizes: 46, 48, 50 cm.



Easy-Boarding with 5Ah NiCd-Batterie 1590.- Euro



E-Three Wheeler with 5 Ah NiCd Battery: 1999.- Euro



drive unit kit NiMhd battery: 1123.90 Euro

estelle "Elegance"

Heinzmann GmbH & Co. KG



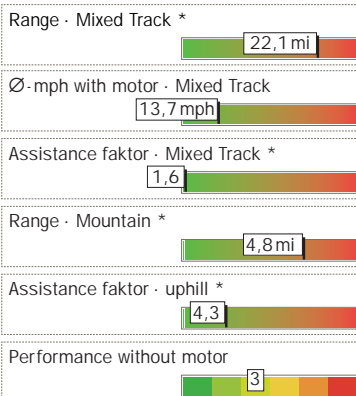
Estelle "Elegance" is outstanding with high-quality and long-lasting components, combined with a solid frame with full-suspension.

The Heinzmann motor features a comfortable and powerful start-up assistance. It enables kick-off up to 6 km/h (3.7 mph) without added pedaling and is therefore fully satisfactory, even in very steep inclines. For ten years the company of Heinzmann has been steadily developing its components to be of high longevity and low maintenance. Battery, motor and nearly all other electric parts are of European manufacturing. Yet, some optical details are in need of improvement such as the bulky plugs and the battery holder at the carrier.

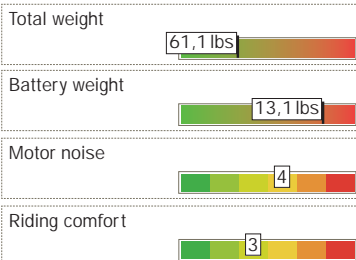


The saddle was found especially comfortable by all test riders. Good and high-quality engineering, unfortunately with many untidily laid cables and bulky plugs.

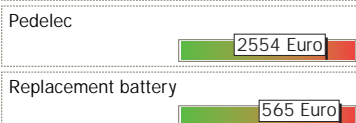
Riding Performance



Specifications and Ratings



Price



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Strong motor assistance uphill and easy kick-off with no pedaling up to 6 km/h (3.7mph)
- + Comfortable frame suspension and seat
- + Optional second battery doubles the range

- Right hand brake lever too short and uncomfortable to use for riders with small hands
- Mounting the battery requires a skilled hand

Address

Heinzmann GmbH & Co. KG
Am Haselbach 1
79677 Schönau
Germany
Tel: +49/(0)76 738 208 313
a.reinhard@heinzmann.de
www.estelle.de

Components / Accessories

Quality bicycle components, Shimano gear shift, V-brakes, U-lock, no air-pump, dynamo light, separate charger, NiMHd battery, no warranty on the battery but goodwill replacement within 1 year, good user manual, frame size: 50 cm



estelle "Tour" 26" or 28" available as E-Bike or Pedelec, app. 1799,- Euro
estelle "Sport" speed version (38 km/h) app. 2499,- Euro

Front wheel-motor 36V/500W - 22 km/h controller 36V - 25A, battery set: NiCd 36V - 5Ah 1.089,- Euro



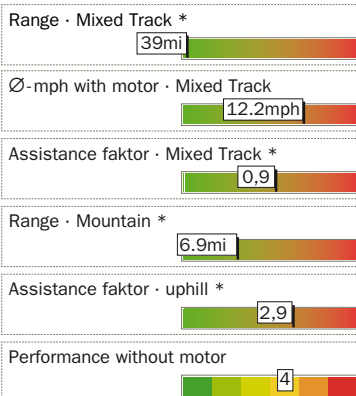
Throttle with built-in LED capacity indicator although voltage-based indication is inaccurate. The main switch at the rear carrier can be forgotten. Here, automatic switch off is missed when not in use for a while.

Recommended for long range and good motor assistance. BinBike is ideal for expanded bike tours with good motor assistance.

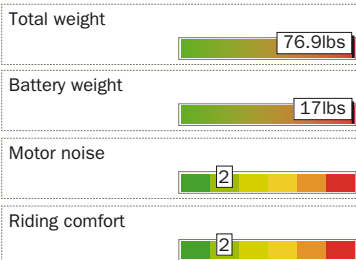
Thanks to its silent yet powerful drive BinBike lets you glide along beautifully. The combination of range and good assistance factor is excellent. With this pedelec in every-day life there is no need to worry whether the batteries will last until you get home.

Nevertheless, its long range comes with high overall weight. As the battery cannot be removed, the user should own a frost-free parking area with electricity. The 28" wheel has been tested to be very pleasant for big and heavy persons.

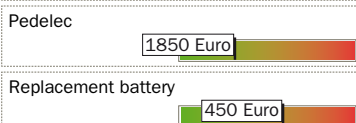
Riding Performance



Specifications and Ratings



Price



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

** Could not be measured because the battery is build into the frame and cannot be removed. Information by the manufacturer.

- + Very high range at good motor assistance
- + Quiet motor and energy recuperation while riding downhill
- Battery capacity indicator at the throttle inaccurate
- The battery is built into the main frame and cannot be removed for recharging

Address

bvba EUROMOTO
 St-Amandse Steenweg 218
 B-2880 BORNEM (BELGIUM)
 Tel: +32/38 99 28 79
 binbike@euromoto.be
 www.binbike.com

Components / Accessories

Quality bicycle components, Shimano gear shift, rim brakes, U-lock, air-pump, batterylight, separate charger, NiMhd battery, missing user manual, just frame size: 54 cm with 26 and 28 Zoll Radgröße erhältlich, 1 year implied warranty



BinBike Custom 1660, Euro



BinBike Low Step 1600, Euro 24 Volt · 1735, Euro 36 Volt Version



BinBike offers as well the motor kit as pedal first for 380 Euro and direct start kit 395 Euro

ALU - Touring

SACHS BIKES



Recommended for highest range tested and good price-performance ratio ALU touring has lived up to its name, ideal for mellow, expanded bike tours!

The combination of high battery capacity and low support factor contributes to its long range. The optional battery bag for its right side can double the range.

However, the test team could have done with less range and weight in order to gain more support instead. It takes some time to get used to the fact that due to its system the bottom bracket centre has too much play.

ALU-Touring excels in good craftsmanship and nice detail solutions.



Convenient: the charger can be placed in the saddle bag above the battery.
Solid: Sram hub gear shift and Sanyomotor and torque sensor

Riding Performance

Range · Mixed Track *
39.8mi

Ø-mph with motor · Mixed Track
11.4mph

Assistance faktor · Mixed Track *
0,3

Range · Mountain *
8mi

Assistance faktor · uphill *
1,7

Performance without motor
4

Specifications and Ratings

Total weight
72.7lbs

Battery weight
15.2 lbs

Motor noise
3

Riding comfort
2

Price

Pedelec
1899 Euro

Replacement battery
423 Euro

* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Very high range which can be doubled by an optional second battery
- + Accurate battery capacity indicator
- + Energy recuperation when braking
- High battery weight
- Riders with large feet might hit the dynamo with their shoes while pedaling

Address
Sachs Fahrzeug- & Motoren-
technik GmbH
Ernst Sachs Strasse 6
90441 Nürnberg
Germany
Tel: +49/(0) 91 14 23 10
info@sachs-bikes.de
www.sachs-bikes.de

Components / Accessories

Quality bicycle components, Shimano gear shift, front rim brake, coaster brake, U-lock, no air-pump, dynamo light, separate charger, NiMhd battery, good user manual, 2 years implied warranty, frame size: 48 cm



Optically almost like the ALU-Touring the Alu-Electra the E-Bike version 1899 - Euro



Exclusive custom made bike: Electric Glider, prize and delivery times on request



Second pannier bag for the right side with holder: about 45 Euro

Helkama Velox Oy



Pleasantly plain, easy and mellow riding: The Helkama Jubilee.

Jubilee is the first Helkama pedelec available on the free market. Helkama has been providing the Finnish Post with utility pedelecs for years.

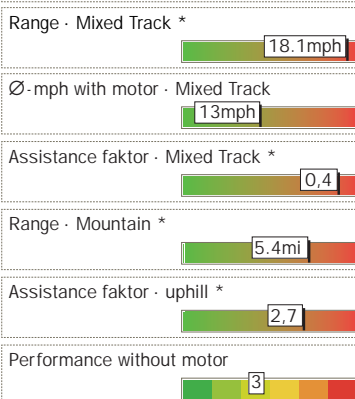
Jubilee is among the lightest products tested, and has an neat handlebar, attached merely with a brake lever, the on-off switch for the Panasonic drive unit and a bell.

At a comfortable ride, the Auto-D system reliably assumes switching.

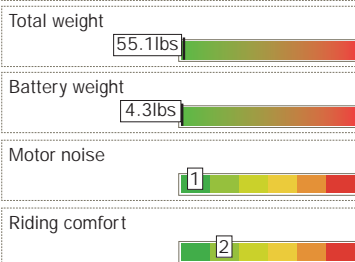


Neat cockpit and a big basket at the handlebar
At loose pedalling the Shimano-Auto-D gear shift provides the right gear. Only when changing into lower speeds it takes too long to shift.

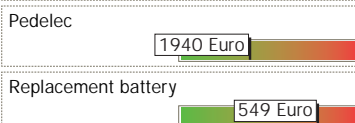
Riding Performance



Specifications and Ratings



Price



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Small weight provides easy riding even without motor
- + Easy operation, short range is not a problem, as second battery weighs 1.9 kg only
- Panasonic drive and Shimano Auto D gear shift do not interact ideally

Address

Helkama Velox Oy
Santalantie 22
10940 Hanko, Finland
Tel: +358/192 80 61
jari.raininko@helkamavelox.fi
www.helkama.com
www.helkamavelox.fi

Components / Accessories

Quality bicycle components, Shimano Auto-D gear shift, rear wheel hub brake, front wheel rim brake, U-lock, air-pump, dynamo light with twilight sensor, rear light off battery, separate charger, Lithium battery, 1 year battery warranty, good user manual (only English), frame size: 47 cm.



E-Trike 1990.- Euro

Gazelle Easy Glider

Koninklijke Gazelle



Easy Glider is inspiring in every detail. A pedelec of a piece.

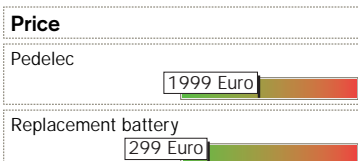
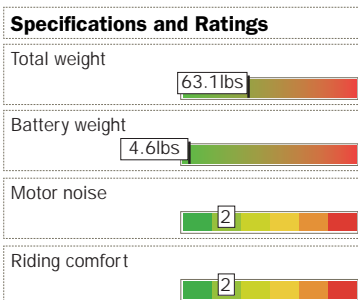
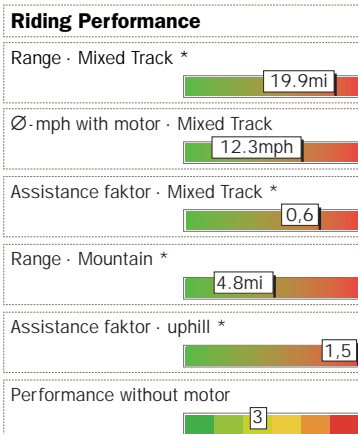
Truely regal is how you feel on Easy Glider by Gazelle, the renowned dutch manufacturer. For beautifully relaxed rides in every-day life.

Handlebar and saddle position are easily adjustable without tools. The front light has a twilight switch and goes on and off when needed, irrespective of the battery. The key to the solid U-lock also fits the battery lock. The price-performance ratio is convincing, especially because of the spare battery's very fair price, unlike other manufacturers, who charge twice as much for the same.

The overall positive impression could not be diminished by the fact that uphill riding was rather slow, the ride was always very comfortable.



Comfortable handlebar with details of perfect design and high functionality
The solid extra long kick-stand ensures a secure stand



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Very comfortable to ride
- + Well-equipped in every detail
- Low assistance factor uphill

Address
Gazelle GmbH
Grenzwaldstrasse 55
41334 Nettetal 2
Kaldenkirchen
Germany
Tel: +49(0) 21 57 42 20
y.oezel@gazelle.de
www.gazelle.de

Components/ Accessories

High-quality bicycle components, Shimano 8-speed gear shift, hub brakes, U-lock, air-pump, hub dynamo light in the front, light off the battery in the rear, light with twilight sensor, separate charger, Lithium battery, no user manual, frame sizes: step-through 49, 53, 57 cm; man's frame: 57 cm



Version with top tube for large frame sizes
Versions 1999,- Euro

Twist Comfort

Giant Bicycles



Giant provides the best price-performance ratio tested

If you are looking for an expensive and beautiful escort for daily service, you will find it in Twist Comfort. Only longtime approved trademark components have been employed. Good details, such as twilight-activated lights are very rare, on even more pricey models. Range and assistance are not exactly exhilarating but the test team found its overall weight and price inspiring and so far unique.

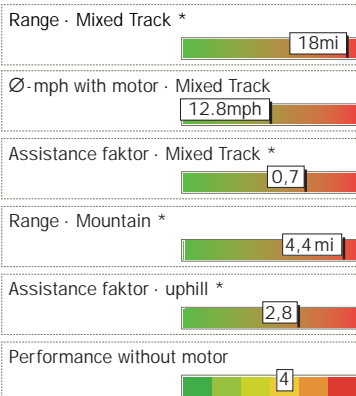
We also recommend to take a closer look at the EZB pederlec model by Giant with its rather exotic appearance.

The seat is easily adjustable to individual preferences and is therefore very comfortable.

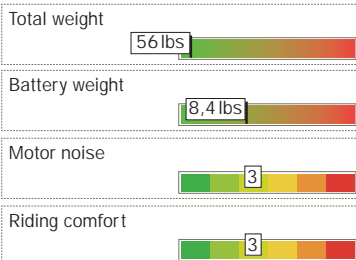


Giant bike uses the Panasonic drive with Ni-Mhd battery, time-tested for years. Rather comfortable: Thanks to twilight sensor the hub dynamo light goes on automatically, when needed.

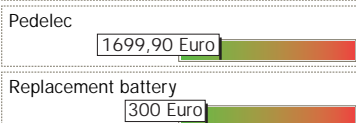
Riding Performance



Specifications and Ratings



Price



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

- + Good kick-off motor assistance
- + Low center of gravity
- Short range
- Uneasy and slow switching of gears under load

Address
 Giant Deutschland GmbH
 Mettmanner Str. 25
 40699 Erkrath
 Germany
 Tel: 0211/99 89 40
 info@giant-bikes.de
 www.giant-bicycles.com

Components/ Accessories

Quality bicycle components, SRAM 5-speed gear shift, hub brakes, U-lock, no air-pump, hub dynamo light with twilight sensor, separate charger, NiMhd battery, 6 months battery warranty, good user manual, frame sizes: 45, 50 and 54 cm.



The EZB is a unique product offering many ergonomic features to adapt the bike perfectly to the rider: 1999,- Euro

SPARTA ION m-gear

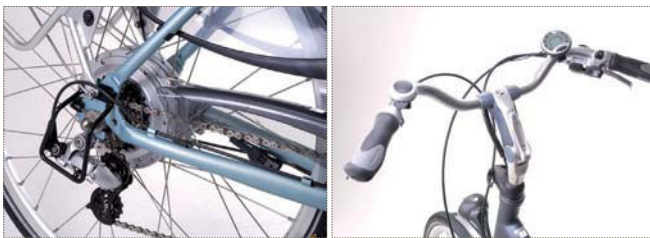


SPARTA BV

A high-quality equipped pedelec, flawlessly hiding the modern electronics.

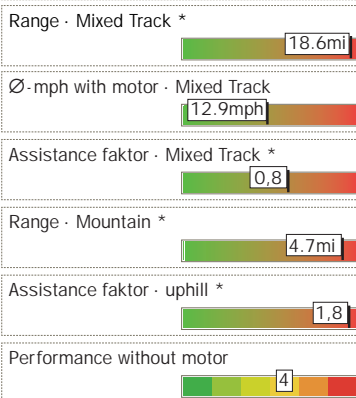
In recent years, the Sparta ION pedelec series has convinced ten thousands of customers with its concept.

Our test riders mainly rode the power mode (with the strongest assistance), because they found the low-land economy programs insufficient on the hilly test track. Truly genius is the switch unit, camouflaged as a bike computer. Other than the classical functions (speed, trip kilometres etc.) it shows the current riding mode and turns on and off the light. If an electric defect occurs, the user is informed on the computer display. The computer is also a key. It communicates with the battery electronics, where the owner's personal data is saved and which is situated in the main frame, along with the battery. An excellent theft protection.

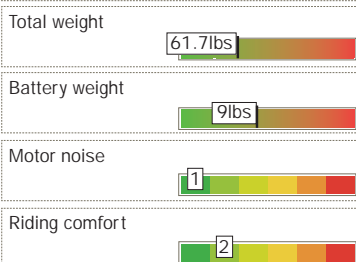


Comfortable and neat handle bar with numerous adaptabilities - Small hub motor with good assistance only on level tangent and on small hills, not designed for long uphill rides.

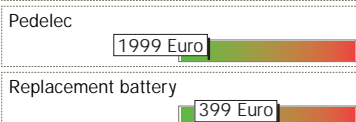
Riding Performance



Specifications and Ratings



Price



* Test rides were done at an average temperature of 3°C. The outside temperature has an influence on the marked data. With decreasing temperature these data also decrease.

** The given ranges were calculated mathematically because the tested bike used a 9 Ah battery and the latest model with 10 Ah has just recently entered test. 10 % were arithmetically added to the actually measured data. These were: Mixed Track 27 km, mountain 6.9 km. The calculated data will be reviewed with the new model, soon.

- + Outstanding service interface: the dealer can immediately analyze problems by means of the on-board computer and adapt the settings to the customer
- + Absolutely noiseless motor
- The battery cannot be removed from inside the frame for charging

Address
 SPARTA BV
 Wilmersdorf 37
 7327 AD Apeldoorn
 The Netherlands
 Tel: 0031-55 3578700
 info@sparta.nl
 www.sparta.nl

Components/Accessories

High-quality bicycle components, Shimano derailleur, front hub brake, coaster brake, U-lock, air-pump, light off the battery, (when the battery is empty, the motor functions as dynamo), NiMhd battery, 2 years implied warranty, separate charger, good user manual, frame sizes: 46 , 50, 55 cm; man's frame: 50, 54 and 59 cm



The SPARTA ION Cityseat features a great new ergonomic pedaling position it sells for 1899,- Euro



The SPARTA ION Comfort 1799,- Euro



Additional pannier mounted Battery it can double the range 9 Ah: 399,- Euro