



eBike Systems





Pioneers of eBike Systems

eBike Systems

Constant evolution since 1993

Marking thirty years as the Pioneer of the eBike
The electrically power-assisted bicycle or eBike System is seeing impressive growth around the globe today, but it was Yamaha Motor that pioneered the first eBike back in 1993. It mounted the first iteration of the company's signature Power Assist System (PAS), in which an electric motor is used to provide an assistive force to the pedaling power of the rider in a manner that feels natural and in tune with human perceptions. Simply named the "PAS" after its headline feature, the bicycle was hailed as the first of its kind in the world and enjoyed a successful market debut.

Ultimate rider-machine unity
Each model in Yamaha's extensive range of eBike Systems is designed to offer the ultimate feeling of rider-machine unity. Equipped with advanced technologies, including Automatic Support Mode and Zero Cadence Technology, each PWseries drive unit delivers seamless and natural performance for a very special riding experience that is like no other.

New PW-XM drive unit: Yamaha's new lightweight flagship model
For 2024 Yamaha's range is headed by the new PW-XM, a compact high specification drive unit aimed at the high-end e-MTB segment. This is the lightest and most sophisticated model ever produced by Yamaha that delivers the highest torque-to-weight ratio – and with an identical silhouette to the proven PW-X3 and PWseries S2, it can be mounted straight into existing eBike designs.

Made of Magnesium, born in Morimachi
A key feature of the PW-XM is its ultra-low weight of only 2.6 kg that has been achieved by the extensive use of a high quality magnesium housing that enhances the premium looks and high quality feel. PW-XM's magnesium parts have been developed using in-depth knowledge gained in the manufacture of components for the Yamaha R1M Supersport motorcycle. As well as standing for 'magnesium', the 'M' in the product name is also a reference to the motor's birthplace in Morimachi – a bike-centric city famous for its mountain biking and cycling tourism, making it the

perfect place for the birth of this new flagship eMTB drive unit.

The new PW-XM can be paired with any of the company's displays and batteries, best in conjunction with with the minimalistic and highly technical Interface X.

Yamaha's accelerated carbon neutrality goal
eBike drive units are one example of the company's contribution towards making a better world, and as part of Yamaha's accelerated carbon neutrality goal for 2035 the production of PWseries models will relocate to the MBK Industrie's factory near Paris.

The move to a European manufacturing plant will play a major role in reducing Yamaha's carbon emissions by 92% between 2010 and 2035. With ISO 14001 certification for environmental protection, and ISO 9001 certification for quality enhancement – MBK Industrie is ready to offer the highest levels of service to our EU customers.

Mountain Biking

Sports and Trail



PWseries S2

75 Nm



PW-X3

85 Nm



PW-XM **NEW**

85 Nm

Trekking and Adventure



PWseries CE

50 Nm

Comfortable Commuting

Daily City Ride

< Paved Road

Rough Terrain >

Core Rider >

< Casual Rider

Extensive Experience

Extensive experience in the eBike business verifies the Yamaha eBike System as a first class product.
The World's first Power Assist Bicycle was sold in 1993.

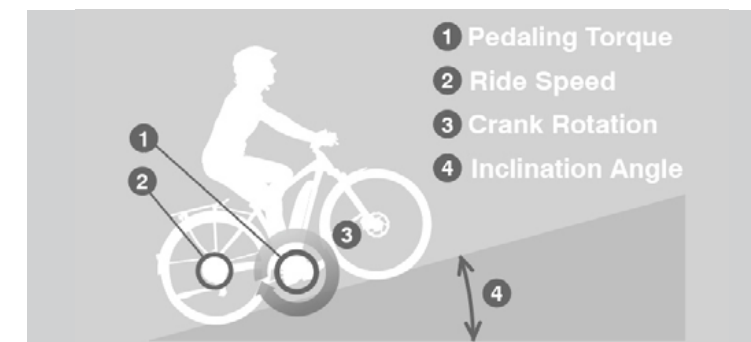


Intuitive operation and natural riding

Drawing from Yamaha's long history of engagement with motorsports, the assist setting know-how applied to Yamaha's eBike Systems provides a powerful yet natural and intuitive riding experience.

Sensing technology that supports your riding experience

Based on its sensing technology, the system automatically detects riding conditions and delivers the appropriate assist power and acceleration.



Approved by technicians

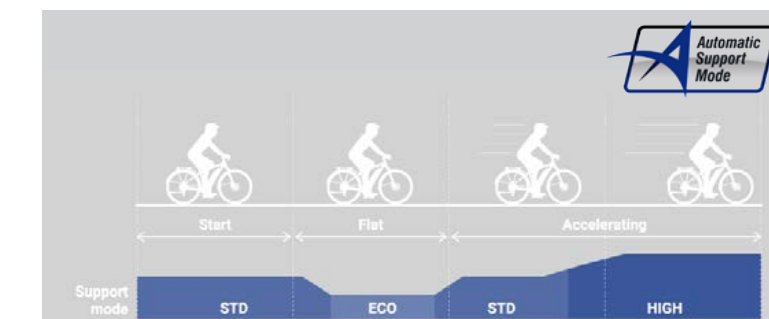
Over the years, Yamaha has earned a reputation for high standard quality, offering eBike Systems with excellent reliability.
Maintenance free: the unit needs no regular replacement of internal components. Ride far without the worries of not having your trusted technician nearby.
Features excellent resistance to external factors and overheating. Just ride longer and enjoy a wide variety of landscapes.



Automatic Support Mode

The expression of Yamaha's tuning know-how in each riding scenario
Each of the sensors monitors the riding conditions, and algorithms automatically select the appropriate level of pedal assistance. The result is a fine-tuned, user-friendly ride.

The algorithms are created individually for each of the drive units on the line-up, creating the experience expected for each riding situation. If you wish to shift between assist modes manually, you can turn the Automatic Support Mode off. Feature available in all drive unit models.



Example of "Automatic Support Mode" application. Support mode changes automatically.



Drive Units

Redefine Possibilities



PW-XM **NEW**

With maximum torque of 85 Nm and weighing only 2.6 kg, the PW-XM is Yamaha Motor's premium eMTB drive unit. Equipped with lightweight Magnesium housing, produced using Yamaha's extensive casting know-how, this high-tech motor has the highest torque to weight ratio of any Yamaha eBike System.





Premium eMTB market

With its high torque to weight ratio and extremely high quality finish, the PW-XM is the ideal drive unit for premium eMTB models. Yamaha's advanced sensing technology such as Automatic Support Mode and Zero Cadence Technology ensures intuitive operation and natural riding experience.



Cooler running

Together with reduced weight by the extensive use of Magnesium for the motor housing, improvements on heat dissipation have been done, for cooler running, giving consistent performance and high levels of reliability.



In house casting technology

Yamaha has developed sophisticated casting technologies and processes from its extensive experience in the production of lightweight motorcycle components. The ultra-light magnesium housing featured on the PW-XM is manufactured in house by the same production site that realizes parts for the class-leading R1M Supersport motorcycle.



PW-X3 and PWseries S2 compatibility

PW-XM can be fitted straight into PW-X3 and PWseries S2 compatible eBikes, enabling manufacturers to easily enhance their range using existing chassis designs



Yamaha displays and batteries

The new PW-XM can be paired with any of the company's displays and batteries, best in conjunction with the minimalistic and highly technical Interface X.

PW-XM **NEW**



Pure Ride



PW-X3

Yamaha takes its Pure Ride concept to the next level with the all-new PW-X3. Lighter, smaller with higher torque output than ever before, this drive unit delivers instant response for outstanding off-road performance.

The all-new PW-X3 is designed to deliver the purest ride and the most thrilling performance. With its lower weight, more compact size and higher torque output, the PW-X3 has the potential to open up many exciting new opportunities for e-MTB designers.





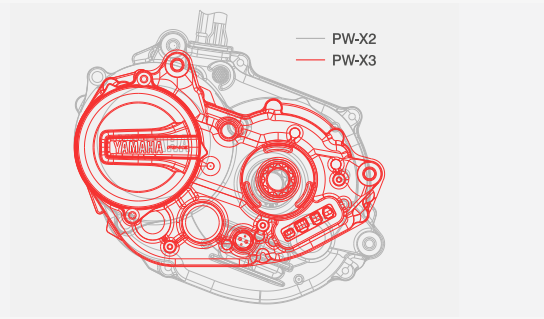
Increased torque

Producing maximum torque of 85 Nm, the PW-X3 is capable of tackling very demanding ascends. The distinctive Yamaha drive unit design enables instant support with sufficient torque immediately after pressure is applied to the pedal, not after certain crank turn.



Lighter than ever

Weighting just 2.75kg, the new PW-X3 is approximately 10% lighter than the previous model, giving an outstanding power to weight ratio for stronger performance and sharper handling.



More compact design

The new PW-X3 is approximately 20% smaller than the PW-X2 model, and its ultra-compact dimensions offer eBike manufacturers greater freedom to develop bikes for ideal frame geometry and suspension kinematics, as well as increased ground clearance.



Natural and agile response to pedalling

Right from the beginning, every PW-X series drive unit has featured the 128mm ISIS interface bottom bracket axle that gives the best Q-factor in any eBike System. Yamaha's Motor new PW-X3 continues with this idealized layout, making it especially attractive to riders.

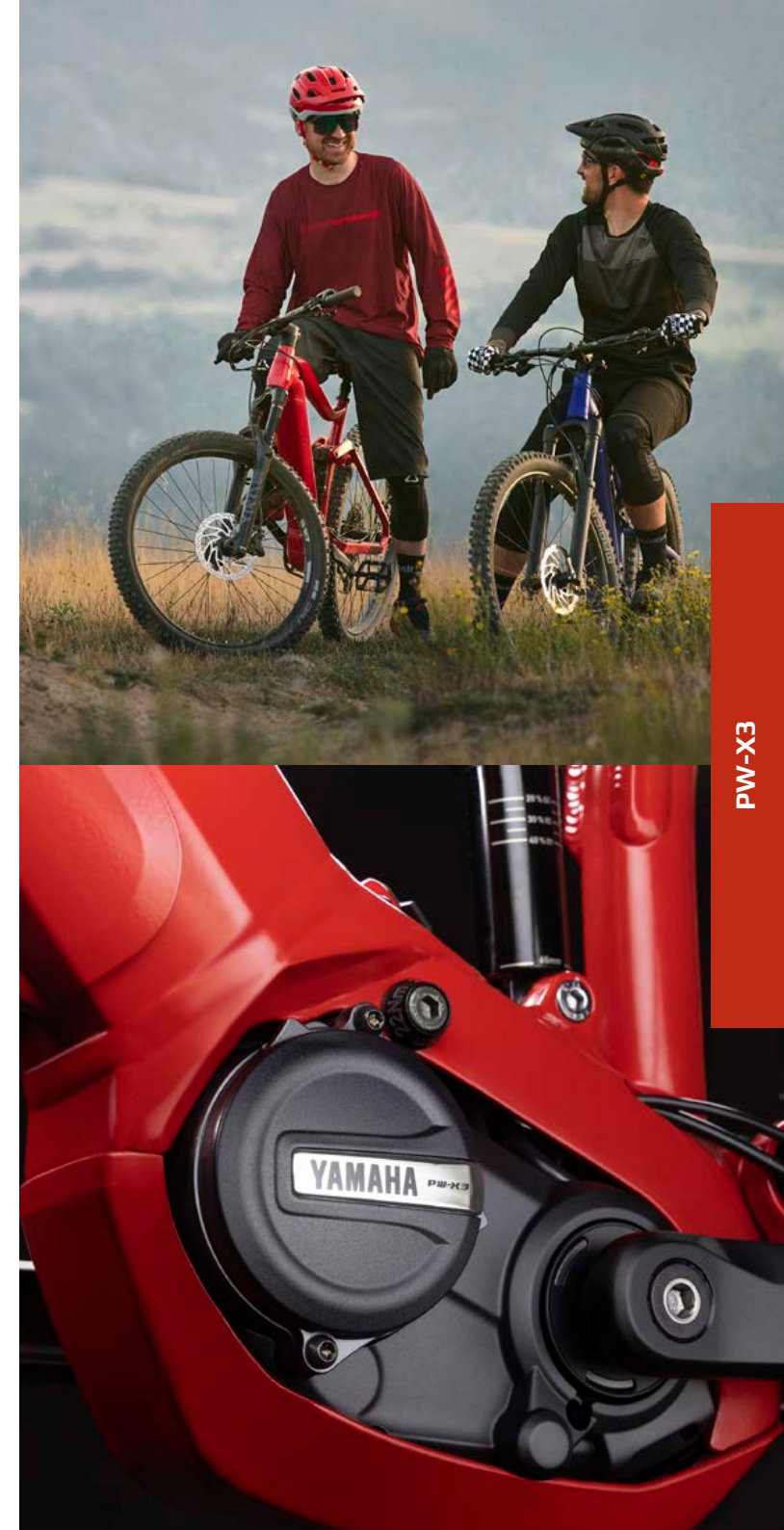


Automatic Support Mode for E-MTB Ride

The PW-X3's exclusively tuned Automatic Support Mode delivers optimal assist different riding settings by choosing from Eco, Standard, and High-Performance Modes as conditions demand. The system reduces assist on level roads but boosts power on steep inclines to offer fine-grained assist feel that makes it seem like it's reading the rider's mind.



PW-X3



PW-X3

Less is More



PWseries S2

Developed with the simple philosophy that 'less is more', the new PWseries S2 is Yamaha's smallest, lightest and most powerful drive unit for the Sport and Trail sectors.

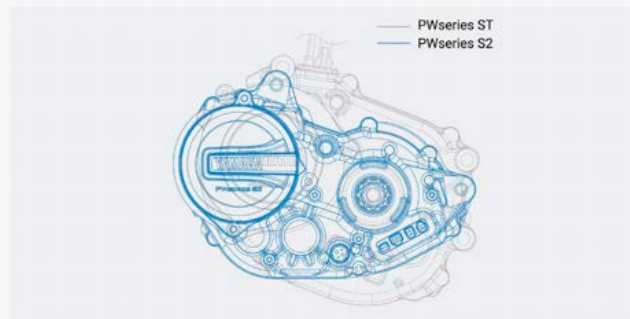
Building on the strengths of the best-selling PWseries ST, the PWseries S2 benefits from Yamaha-exclusive electronic control technologies that ensure strong performance with smooth and natural acceleration on every ride. And like every Yamaha drive unit, quality and reliability are assured.





Increased torque-to-weight ratio

Yamaha's engineers have worked tirelessly to make the PWseries S2 one of the most powerful and lightest drive units in its class. Producing 75 Nm of instant torque and weighing only 2.85 Kg, its torque to weight ratio is among the best in class.



Compact dimensions

As well as being lighter and more powerful, the PWseries S2 is also much more compact than the PWseries ST. Its overall dimensions are comparable to the flagship PWseries X3 model – giving Yamaha's partner bike manufacturers even greater freedom when developing the next generation of chassis designs.



Yamaha-exclusive electronic control technologies

With an extensive experience in eBike systems design and manufacture – combined with a motorsports heritage that goes back to 1955 – Yamaha is recognized as one of the leading innovators in electronic control technology. Benefitting from Automatic Support Mode and Zero Cadence technology, the PWseries S2 delivers an easy, enjoyable and intuitive eBike experience for every rider.



Improved pedalling efficiency and feel

PWseries S2 features a 22.8mm shorter bottom bracket than the PWseries ST, giving improved efficiency and feel for an extremely easy and enjoyable riding experience. A new ISIS bottom bracket axle interface delivers increased rigidity – and being fully compatible with a front double chainring, the compact new drive unit opens up greater possibilities for bicycle manufacturers.



Yamaha quality and reliability

Each Yamaha drive unit is designed to enable every owner to get the most fun and enjoyment out of their eBike on the street and trail. Developed with the benefit of 30 years' experience in the eBike business, the PWseries S2 drive unit is manufactured to the highest industry standards using premium materials and components.

PWseries S2



Natural and
dependable ride



PWseries CE

It just feels so natural!

Yamaha Motor focused the PWseries CE development efforts in the achievement of natural enjoyable ride. Measures taken include: weight and noise reduction, implementation of the Automatic Support Mode and walk assist.

The unit delivers 50Nm of torque and allows the rider to experience all the advantages of an eBike. The PWseries CE was developed to tackle any aspect of city riding, offering ideal support in the flat town center and the hilly and windy village outskirts alike.

The PWseries CE is also compatible with “Coaster Brake”.



Lightweight

The PWseries CE lightweight, starting at 2.9kg, adds to the unit's natural assist setting to provide an enjoyable ride. The rider should feel a light, swift handling while on the move and noticeable lightweight while pushing the bike around.



Automatic Support Mode

The quest for an ever more natural eBike ride goes beyond hardware improvements. The PWseries CE uses Yamaha Motor's extensive software setting know-how in its Automatic Support Mode. The system copes swiftly with constant changes in riding conditions – think of those upwind rides, and constant stops and starts for traffic lights – by automatically selecting the most appropriate support mode. The Automatic Support Mode also provides strong and smooth support for every start. It can be deactivated at the will of the rider.



Most quiet drive unit

Yamaha Motor strived to offer its most quiet drive unit to date, reducing noise significantly. With the PWseries CE, early morning rides in the park closest to you instantly become a relaxing nature-immersive experience.



Walk assist

Handling an eBike should not be a burden when you are off it. The renewed Walk Assist function in the PWseries CE comes in handy when pushing the bike, even up steep slopes or when the bike is carrying heavy loads.



The app used in this smartphone screen refers to the Komoot app.

Displays

Display A



Display B



Display C



Interface X



Display B

Smart, easy and simple to operate

Featuring a simple, durable and reliable user interface, Yamaha's new Display B provides key information in large format via its centrally mounted 3 inches LCD meter, making it perfect to combine with all drive units.

Key Features

- Easy to use, easy to read
- 3 inches LCD centrally mounted screen
- Switch on and go
- Key information in large format
- English, German, French, Dutch, Italian and Spanish language options
- One touch removal



Switch on and go

For ease of use Display B saves previously selected settings such as ride assist mode or lights status (on/off) and can be removed from its cradle with one touch – or for added security it can be removed with a bolt.



Smartphone friendly

Display B's centrally mounted location frees up plenty of handlebar space for a smartphone holder and allows power delivery through a USB micro-B 1 A port that helps prevent smartphone battery drainage when using energy-intensive apps including GPS.

Featuring a minimalist, simple and ergonomic design, the new Interface X is an LED communication unit that allows users to enjoy every second of the ride.

Interface X Features Bluetooth® Low Energy for smartphone connectivity through compatible apps like the e-Sync Connection. Additionally, ANT+™ connectivity feature makes Interface X compatible with cycle computers from brands like SIGMA, Garmin and Echowell.



- Let riders concentrate on the ride
- Freedom to choose display (e.g. cycle computer, smartphone) via wireless communication
- Simple operation



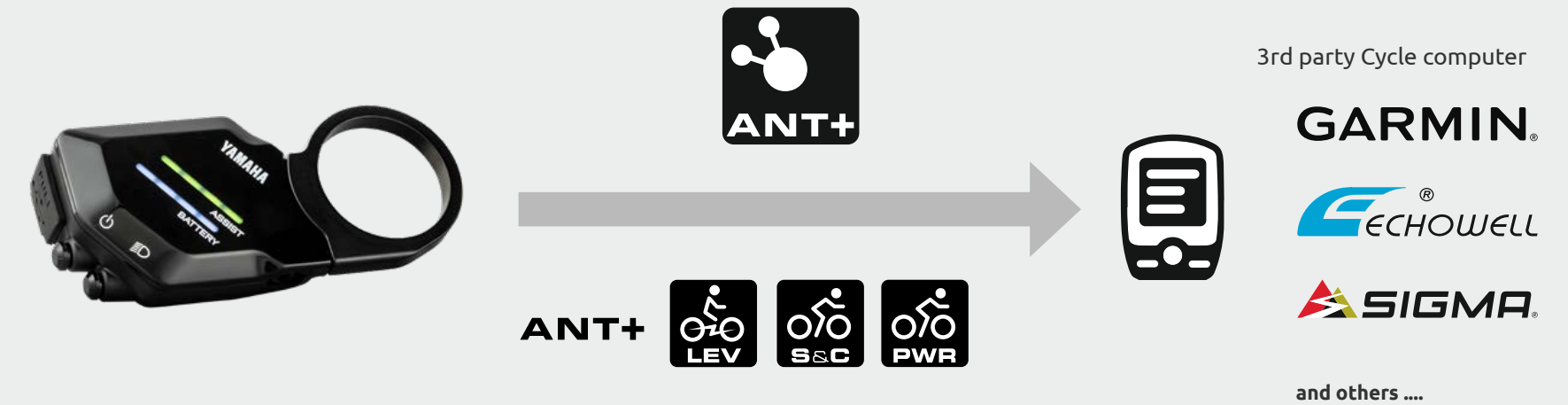
- Ergonomic design of most frequently operated buttons
- Nice coexistence with other components (with brakes, gear shifters, dropper seat levers)



- Excellent blind operation let riders focus on the ride
- Clean Cockpit: Innovative mount system leaves a clean handlebar, leaving it free for lights, cycle computers, smartphone mounts, etc.



This product is ANT+™ certified.
Visit www.thisisant.com/directory for compatible products and apps.



The diagram illustrates the connectivity of the Yamaha YEP1.0 device. On the left is the YEP1.0 device, a black handheld unit with a green display and a large black ring. A large grey arrow points from the device to the right. Above the arrow is the Bluetooth logo and the text "Bluetooth®". Below the arrow, the text "CSCP", "CPP", and "YEP1.0" is listed. To the right of the arrow is a smartphone icon. Further right is the "e-Sync" app logo, which is a blue square with a white stylized 'e' and the text "e-Sync". Above the app logo is the text "3rd party APP", and below it is the text "and others".

Display C

The large 2.8 inch color dot matrix display

Provides clear read-outs and control of the connectivity functions. Several display screens are available for different modes. A newly-designed ergonomic remote switch improves ease of operation. By connecting your smartphone with the display you can enjoy extended features via the app. Display C takes enjoyment of your riding lifestyle to a new level.

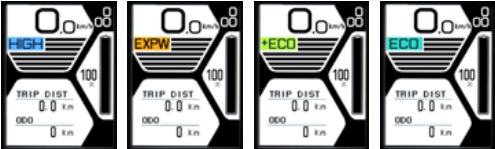
Support to Multiple Languages



Selectable Background Color



Clear information



Apps for enhanced functionality

To further enhance your riding lifestyle, the Display C can show additional information by communicating with specific applications. After downloading the app to your smartphone, and going through a simple set-up process, you can enjoy features including ride management, fitness tracking and map-based navigation.



Komoot

Turn by Turn Navigation Different Routing Offline Navigation



e-SYNC connection

Show detailed e-bike information on the app.

Display A

Designed for a wide range of uses

The Display A was designed for a wide range of uses, from city to trail riding. It features a simplified and easily operable large liquid crystal display, with speed and battery capacity functions. High importance has been placed on visibility while riding in severe environmental conditions. Support mode can be changed at the press of a button as you ride.

Retro Fit Kit

The Display A Retro Fit Kit enables the Display A to be fitted to all PW-X2017/2018 PWseries SE 2018 models.





Battery Pack & Battery Charger



BATTERY & CHARGER

The Battery Packs are designed to cater to a variety of bicycle types

Yamaha eBike Systems offers a full range of “Multi-Location” batteries with a compact, stylish shape that can be easily incorporated into the frame, offering a high degree of design freedom when mounting it inside the frame of a bike. In addition, the down tube and rear carrier mount type batteries are other long-selling options in our product line-up.

External Type



External Crossover Battery 500

- Watt-hour rating 500 Wh
- Voltage 36 V
- Charging time approx. 4.0 hrs
- Weight 2.9 kg

Concealed in the frame



Multi Location Battery 500

- Watt-hour rating 500 Wh
- Voltage 36 V
- Charging time approx. 4.0 hrs (500 Wh)
- Weight 3.0 kg

Battery Charger

- Input voltage 220-240 V
- Frequency 50 / 60 Hz
- Size 184 x 86 x 50 mm (791 cc)



This battery charger can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the battery charger in a safe way and understand the hazards involved. Children shall not play with the battery charger. Cleaning and user maintenance shall not be made by children without supervision.

If the power cable is damaged, stop using the battery charger and have it inspected at an authorized dealer.

Specifications



Drive Units				
Rated voltage	36 V	36 V	36 V	36 V
Rated output	250 W	250 W	250 W	250 W
Max. assist speed	25 km/h	25 km/h	25 km/h	25 km/h
Max. drive torque	85 Nm	85 Nm	75 Nm	50 Nm
Weight	2.6 kg	2.75 kg	2,85 kg	3.0 kg 2.9 kg (Coaster brake)



Displays				
Drive unit compatibility	Displays are interchangeable for all 2023 model year 25km/h drive units.			
Display type	Multicolor LED	2.8 inch TFT full color	3 inch LCD screen	1.7 inch LCD
Power supply	1,200mA (with PW-X3) 1,000mA (with other units)	1,000mA	1,000mA	N/A
Connectivity	Bluetooth® Low Energy Technology ANT+™	Bluetooth® Low Energy Technology	USB 2.0 Micro-B	N/A
Functionality (Always on)	Battery capacity indicator Assist mode indicator	Speedometer Battery capacity indicator Battery capacity (%) Assist mode indicator Assist power meter Clock	Assist mode indicator Speedometer Battery capacity indicator Automatic Support Mode indicator Clock Light indicator	Speedometer Battery capacity indicator Assist mode indicator
Functionality (Selectable)	Additional features available through smartphone apps or connected devices. ANT+™ profiles: LEV : Light Electric Vehicle S&C : Bike Speed & Cadence PWR : Bicycle Power	Average bicycle speed Maximum bicycle speed Trip meter Odometer Range (Remaining assist distance) Cadence Calorie Consumption Additional features available through smartphone apps or connected devices.	Trip meter Odometer Average bicycle speed Maximum bicycle speed Range Battery capacity (%) Cadence Trip time Supports six languages (English, German, French, Dutch, Italian, Spanish)	Trip meter Odometer Range (Remaining assist distance)



Batteries		
Voltage	36 V	36 V
Capacity	13.4 Ah	13.4 Ah
Watt-hour rating	500 Wh	500 Wh
Weight	2.9 kg	3.0 kg
Approximate charging time	4.0 h	4.0 h



Battery Chargers		
Output current	4 A	4 A
Voltage	220-240 V	220-240 V
Frequency	50/60Hz	50/60Hz
Approximate size	184 x 86 x 50 mm	184 x 86 x 50 mm
Compatible battery type	Down Tube Battery 500 Rear Carrier Battery 500	External Crossover Battery 500 Multi Location Battery 500

Safety Information

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YeSS

Yamaha eBike Systems Service

Based on four key pillars – Technical Support, Warranty, Training, and Spare Parts – Yamaha eBike Systems Service (YeSS) is a comprehensive back up scheme that provides fast and effective support via locally-based teams.

Technical Support

By maintaining a close relationship with eBike Manufacturers – and understanding their specific needs to support Bicycle dealers – Yamaha’s Technical Support teams ensure a fast and efficient back up. The Yamaha diagnostic tool offers Bicycle dealers the following features:

- Instant fault diagnosis
- Creation of Pre Delivery Inspection reports
- Create individual repair records and registrations
- Check latest error codes and technical data for eKit components
- Easy access to eBike repair manuals and parts books



Warranty

Yamaha’s PW series drive units are among the most reliable systems available. If a warranty claim occurs the Technical Support teams are trained to respond quickly and keep parties involved fully informed at all times. The diagnostic tool can generate a diagnostic report which can be submitted to the eBike manufacturer together with a warranty request.

- Fast and efficient warranty service from initial claim to final approval
- Immediate access to every Yamaha eBike System specifications
- Component search function for drive units, displays, batteries and components



Spare Parts

Yamaha is committed to offering one of the quickest and most efficient Spare Parts systems in the business. The company distributes parts and accessories throughout the whole of Europe from two strategically chosen locations in the Netherlands and France.

- Fast and efficient Spare Parts service
- 24-48 hours delivery
- Central Schiphol-Rijk location

Training

Yamaha has unrivalled knowledge in the design and manufacture of eBike Systems, and the Yamaha Motor Academy is continuously training dealers across Europe with a range of highly accessible and engaging online and physical courses. With a mix of on-the-job learning, entertaining e-learning, co-operative interactions and conventional workshops Yamaha Motor Academy offers dealers a premium learning experience.

- Benefit from Yamaha’s unrivalled eBike experience
- Continuously training dealers across Europe with the Yamaha Motor Academy
- Online and physical courses for Yamaha eBike System technicians
- Covering all aspects of eBike drive units, batteries, servicing and diagnostics
- 24/7 access to courses any time of the day or night via PC or Smartphone







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Dealer

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