Panasonic

DRIVE SYSTEMS FOR ELECTRIC BICYCLES

CATALOGUE 2016

Panasonic Cycle Technology Co., Ltd.
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http://panasonic.co.jp/ap/pct/overseas/

Experience riding with comfort and ease

Since we established our bicycle manufacturing company in 1952,
we have concentrated on bicycle research, development, manufacture, and sales.
We have combined our bicycle technology with
the latest electrical power technology as part of our dedication to providing a more comfortable life.
This adds an extra dimension to your experience of cycling.

1952 Began manufacturing and selling bicycles in Japan

1979 Announced the launch of an electric bicycle in Japan

1990 Took part in the Tour de France

1996 Launched an electrically assisted pedal cycle (pedelec) in Japan

2000 Began distributing units in Europe

2002 Launched first ever lithium-ion battery powered pedelec in Japan

2012 Launched rear hub system with rear wheel drive (Europe)

2013 Launched one axle centre motor unit system (Europe)

2014 Launched new 36V front hub motor system (Europe)

2015 Launching of "Multi Speed Assist System" and "Integrated Design Battery"

Multi Speed Assist System

WHAT IS "Multi Speed Assist System"?

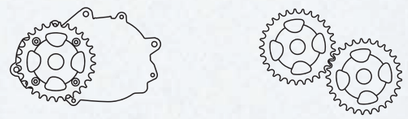
Panasonic's whole new motor unit, which is an electric bicycle motor equipped with an internal two-speed gear.

DUAL GEAR

• Front mount motor unit (Inter 2)

Voltage	:	36V
Weight	:	Approx. 4.8kg
Output	:	250W (Pedelec)
	:	350W (S-Pedelec)
Front gear	:	Inter 2
Gear teeth	:	29 T or 35T

New technology



Assist Motor + Two speed = Wonders!

Even though this is an electric bicycle motor, its internal two-speed gear serves as a two-speed front gear. In combination with the rear hub gears, it offers sportier riding than ever. The new gear feature also enhances the electric consumption efficiency of the motor. It can be used in a belt-driven electric bicycle.

Electric shifting

Riders can shift the gear using operation buttons on pedelecs.

Smooth shifting

The motor torque is adjusted during shift change, enabling a smoother shifting operation.

Wide Gear Ratio

The ratio of low gear is 1:1 and that of high gear is 1:1.415.There are two types of front gears that suit normal and speed pedelec functions.

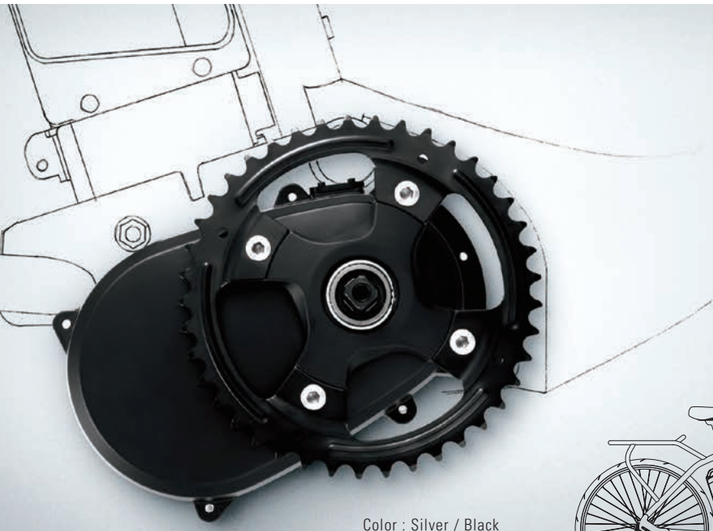
• Gear teeth and gear ratio at each position

29T	Low	29T	(1 : 1)
	High	41.035T	(1 : 1.415)
35T	Low	35T	(1 : 1)
	High	49.525T	(1 : 1.415)

*High gear teeth is calculated based on the gear ratio.

36V Center Motor Unit

A midship design which takes the motor load balance into account.
A simple single gear design which looks smart and is easy to maintain.

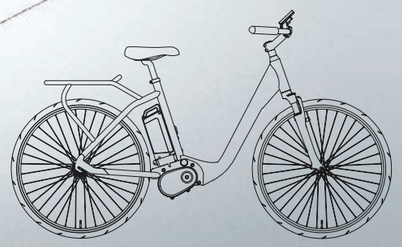


Color : Silver / Black

Single Gear

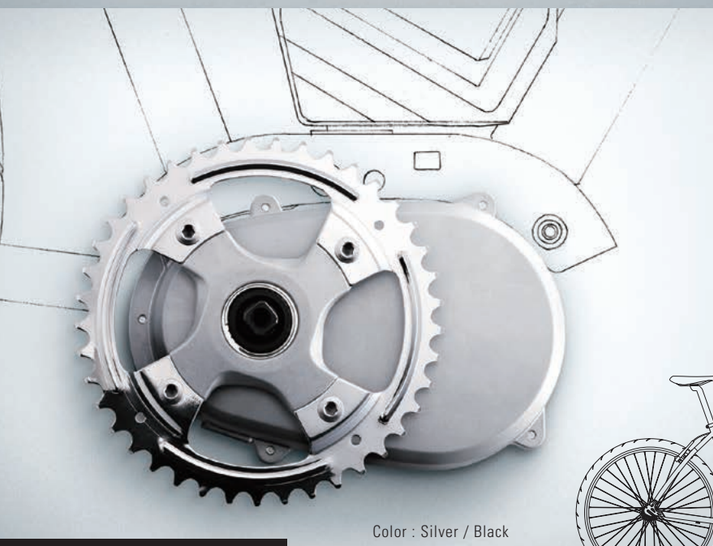
For comfort model

A rear mount type for standard
casual use pedelecs and speed pedelecs.



• Rear mount motor unit

Voltage	:	36V
Weight	:	Approx. 4kg
Output	:	250W (Pedelec)
	:	350W (S-Pedelec)
Front gear	:	Single
Gear teeth	:	41T
Shimano Di2	:	Correspondence

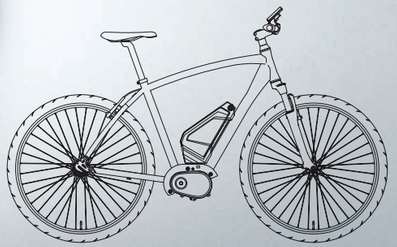


Color : Silver / Black

Single Gear

For active model

A slimmed-down, short-bodied front
mount type, ideal for trekking or sports.



• Front mount motor unit

Voltage	:	36V
Weight	:	Approx. 4kg
Output	:	250W (Pedelec)
	:	350W (S-Pedelec)
Front gear	:	Single
Gear teeth	:	41T
Shimano Di2	:	Correspondence

*S-Pedelec motor is not suitable for use on bicycles featuring a coaster brake.

Correspondence with Shimano Di2

Our new motor is compatible with Shimano Di2 (Alfine, Nexus).The pedelec system supplies power to Di2 and indicates the shifting position on a console display.

Di2 DIGITAL INTEGRATED INTELLIGENCE
ALFINE
Nexus
*Internal system only

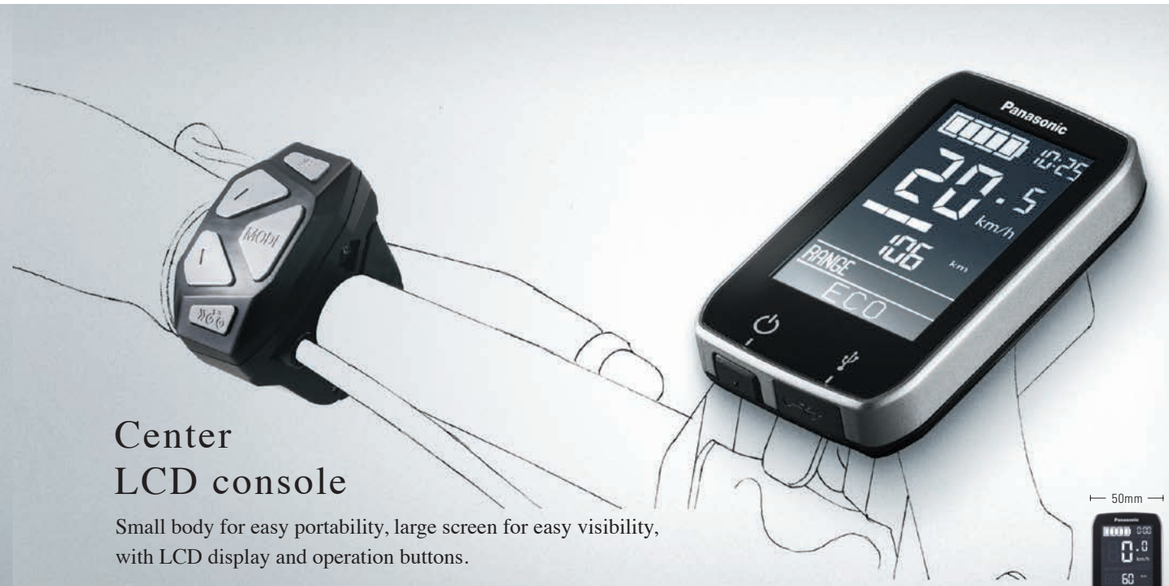
*Display indication of gear position (> Page 06)

⚠ Dealers and users are not able to install Di2 on a pedelec that not installed Di2 originally.

Console Center LCD Type

The console provides full control

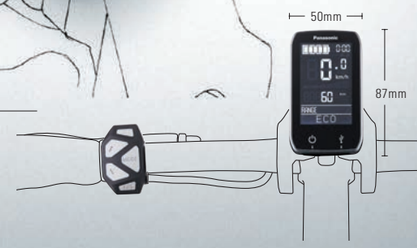
Designed to be visible in strong sunlight, and tough enough to withstand rain, wind, and dust.



Center LCD console

Small body for easy portability, large screen for easy visibility,
with LCD display and operation buttons.

Clock / Micro USB Port / Center Display / Detachable Display / Separated Buttons / Walk-Assistance Button / IPX5 / 10 Language Indication / Speed / Average Speed / Max. Speed / Riding Distance / Total Riding Distance / Rest Riding Distance / Battery Charge Level / Assist Power Indicator / Backlight / Gear position (Depends on pedelec)

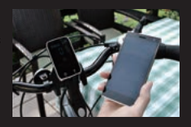


Display Indications

This function helps when pushing a heavily loaded e-bike up a steep slope.

Smartphone charging

Allows charging of smartphones via special Panasonic USB connector,Maximum charging current 1A



Diagnosis at dealers

Some Panasonic e-bike dealers are able to use this feature in conjunction with PC software to diagnose defects.
(> Page 10)

Li-ion Battery

A lithium-ion battery for optimum output on long journeys.

Based on research to develop the optimum battery,
Panasonic has been integrating lithium-ion batteries into its pedelecs since 2002.
We have just launched our latest cutting-edge battery model.

Integrated Design Battery

The battery technology for high capacity cells, optimum safety design, and our vast knowledge in the field of home appliances have resulted in the development of a sophisticated battery for pedelec by combining a sporty design and an electric assist function. The design has also achieved stability on the frame and user friendliness.

*The photo shows a Flyer's battery.

• SPEC

	8Ah / 288Wh	12Ah / 432Wh
Voltage :	36 V	36V
Capacity :	8Ah	12Ah
Energy :	288Wh	432Wh
Weight :	Approx. 2.3kg	Approx. 3.3kg

*The above developmental values are provided for information purposes only and subject to change.

15 Ah / 540 Wh

Upright

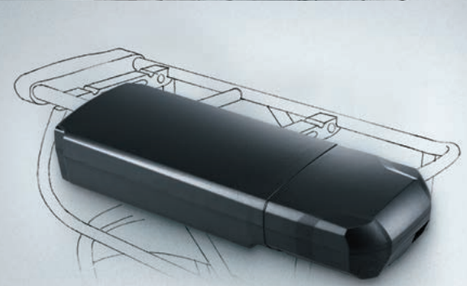
Easily detachable standard type.

12 Ah / 432 Wh

18 Ah / 648 Wh

• SPEC

	12Ah / 432Wh	15Ah / 540Wh	18Ah / 648Wh
Voltage :	36V	36V	36V
Capacity :	12Ah	15Ah	18Ah
Energy :	432Wh	540Wh	648Wh
Weight :	Approx. 3.2kg	Approx. 3.8kg	Approx. 4.4kg



Rear Carrier

Ideal for both casual use and trekking.

• SPEC

	8.8Ah / 317Wh	11Ah / 396Wh	13.5Ah / 485Wh
Voltage :	36V	36V	36V
Capacity :	8.8Ah	11Ah	13.5Ah
Energy :	317Wh	396Wh	485Wh
Weight :	Approx. 3.1kg	Approx. 3.9kg	Approx. 4.0kg

Triangle

Sporty type that attaches to the down tube.

• SPEC

Voltage :	36 V
Capacity :	12 Ah
Energy :	432 Wh
Weight :	Approx. 3.3 kg

Down tube mount type battery

We are developing another type battery for sports e-bike for MY 2017.

Battery cell

This new type of battery cell, which was developed for a compact design, has been installed in such a integrated design battery for the first time.

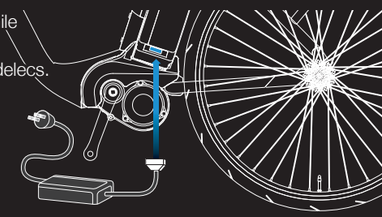
Charger

	36V	
Battery type	Upright / Triangle	Rear carrier
Energy	15Ah battery	13.5Ah battery
Charging current	3A-4A (variable)	2.5A
Dimension (mm)	203 x 94 x 56	
Weight	Approx. 1,260g	
Charging time until 100%	Approx. 6 hours	Approx. 7 hours
Charging time until 80%	Approx. 4 hours	Approx. 4.5 hours

Battery Charging on Vehicle

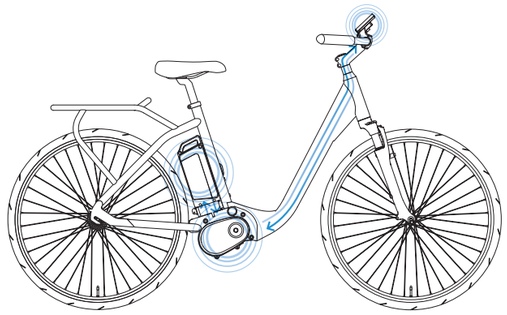
Allows charging while the battery is still attached to the pedelecs.

Must be used under the cover of a roof.



Panasonic Premium Cycling Techology

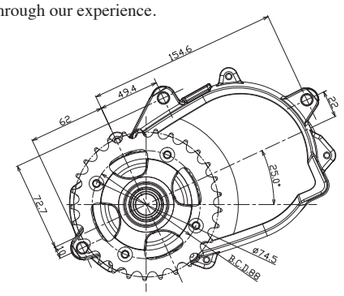
System Strengths



Panasonic looks at the motor, controller, torque sensor, battery, and hand console as one single unit, and call this the Smart Integrated Management System. This consolidated system technology enables us to produce high-quality, high-efficiency pedelecs, giving our customers a premium cycling experience.

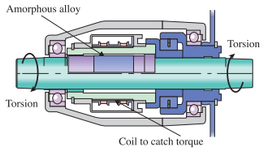
New Motor Technology

The resin gears of the centre motor have an efficient design that achieves both high precision and high strength for extremely quiet power assistance. Combination with a torque sensor achieves more comfortable and smoother riding.The internal two-speed gear called Multi Speed Assist System is one of our new technologies developed and refined through our experience.



Torque Sensor

Non-touch Magnetic Torque Sensor



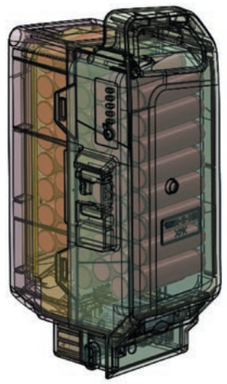
The high-precision torque sensor is responsive to changes in pedal power when starting, climbing, and accelerating.
A detector coil measures pedaling torque and sends an output power signal to the controller, allowing the level of pedaling torque to be detected without contact or energy loss.

Battery Technology

Our high-capacity cells have enabled us to produce a compact high-capacity battery. Optimum safety is achieved through our unique battery management technologies and knowhow in the field of home appliances.
Based on our experience relating to home appliances we have selected the cells used in each type of battery depending on the voltage and capacity.

Battery Management System

One microcomputer and two voltage monitoring ICs have been mounted, and charging/discharging and temperature of cells are controlled.Also, overcharge/overdischarge and excessive temperature increase are prevented by communication control between the motor and the charger.Therefore, performance, safety and quality of the battery have been preserved.Moreover, a fuse has been mounted as multiplex protection.



Flame-resistant resin

Our original flame-resistant resin covers each battery cell to ensure integrity and a safe, flame-resistant li-ion battery.This resin enables our li-ion batteries to pass rigorous testing and operate safely.

Waterproof

To protect against water, we pack all cells and circuit boards in vinyl.
(Available and suitable design for outdoor use)

Quality

All designed products have been tested before mass production.Panasonic has a lot of testers for ensure the product quality.
We are able to test not only each devices but also finished e-bike.

Frame fatigue tester

Salt spray testing equipment

Our years of experience in pedelec production in Japan will support our customers, bicycle manufacturers in launching new products.

Every aspect is inspected carefully every motors one by one-we check the water- and dust- proofing, power values, and whether or not the motor is emitting Irregular sounds.

We opened an office in southern Germany in 2012 to support bicycle manufacturers.
Panasonic staff members will visit them and make investigation in case of problems.

Maintenance System

A simple diagnosis is available at dealers that possess a special tool.

Pedelec ..... Key device (Only for dealer) ..... PC

* Enables a diagnosis by connecting a PC and a key device.
* Provides information about riding distance, battery-charging times, and error logs.
* Enables problem details to be checked.
* Consult with a manufacturer doing business with you regarding the tool.