

## DRIVE SYSTEMS FOR ELECTRIC BICYCLES

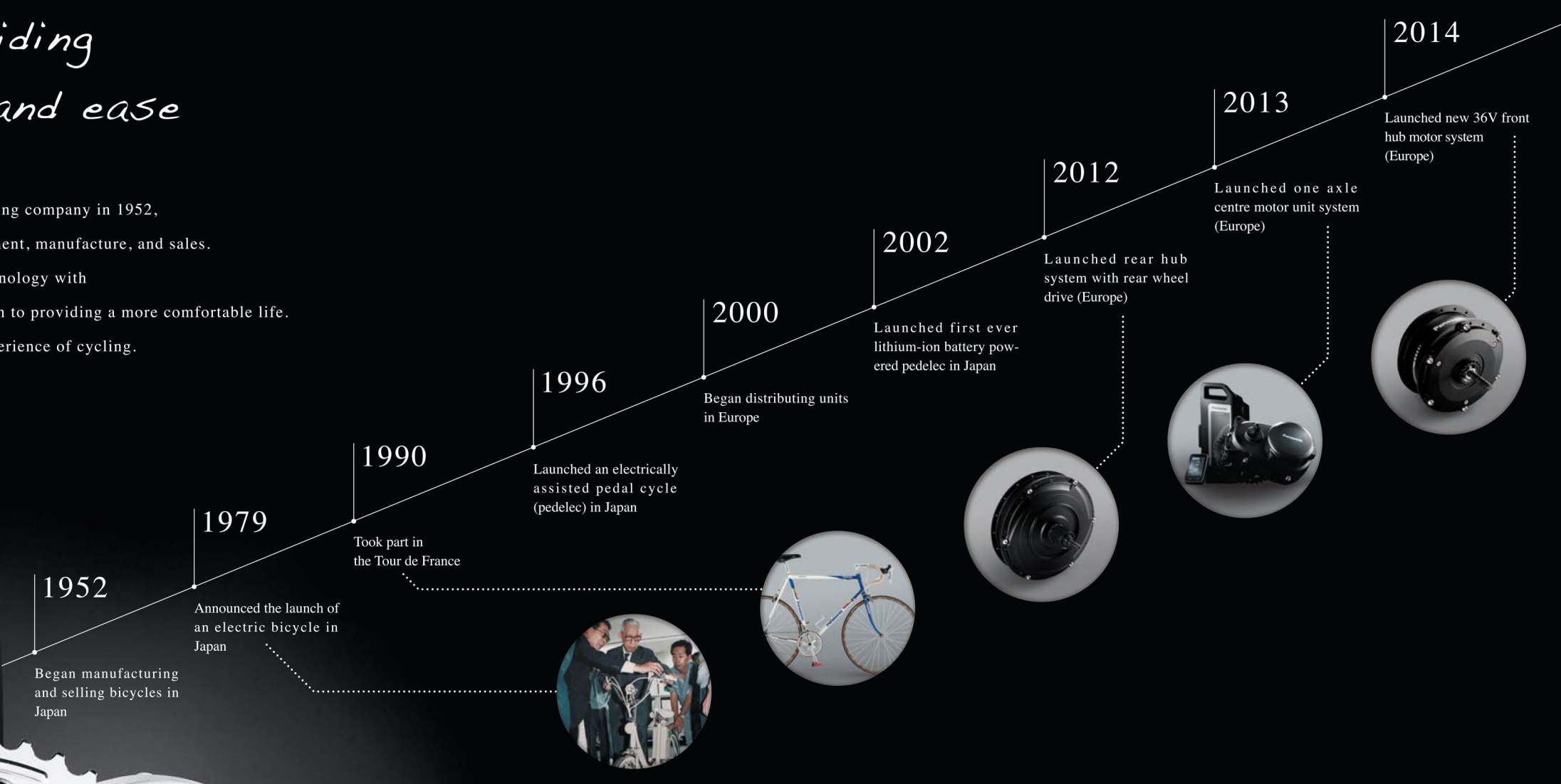


# Experience riding with comfort and ease

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)

## Bicycle Manufacturer

At our Japanese factory, we operate a fully integrated manufacturing process from motor to completed bicycle.



## Quality Management

Our research and development is undertaken based on rigorous bicycle testing enabled by our extensive experience in the sale of finished bicycles in Japan.









# Console

Centre LCD Type / Side LCD Type / Side LED Type

Three consoles which provide full control.

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

## Centre LCD Type

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

Clock / Micro USB Port / Centre 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



## Side LCD Type

Integrated controls and display. Easy to use and handle.

Micro USB Port / Walk-Assistance Button / 10 Language Indication / Speed  
Average Speed / Max. Speed / Riding Distance / Total Riding Distance  
Rest Riding Distance / Battery Charge Level / Assist Power Indicator / Backlight



## Side LED Type

Simple to control and with a clear display.

Micro USB Port / Walk-Assistance Button / Battery Charge Level / Backlight

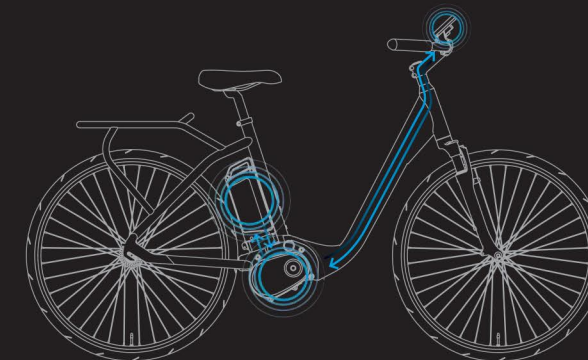


## Three Types of Display Indications



## 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.





# 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.

## Upright

Easily detachable standard type.

- 12 Ah / 432 Wh

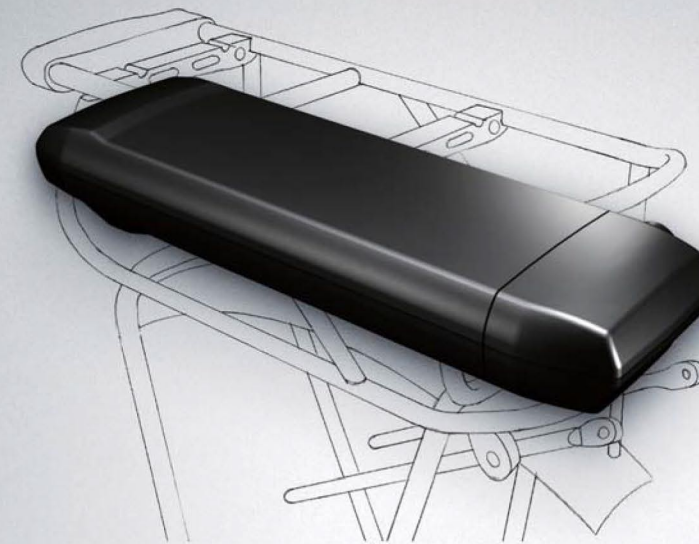
Voltage	:	36 V
Capacity	:	12 Ah
Energy	:	432 Wh
Weight	:	Approx. 3.2 kg

- 15 Ah / 540 Wh

Voltage	:	36 V
Capacity	:	15 Ah
Energy	:	540 Wh
Weight	:	Approx. 3.8 kg

- 18 Ah / 648 Wh

Voltage	:	36 V
Capacity	:	18 Ah
Energy	:	648 Wh
Weight	:	Approx. 4.4 kg



## Rear Carrier

Ideal for both casual use and trekking.

- 11 Ah / 396 Wh

Voltage	:	36 V
Capacity	:	11 Ah
Energy	:	396 Wh
Weight	:	Approx. 3.7 kg

- 8.8 Ah / 317 Wh

Voltage	:	36 V
Capacity	:	8.8 Ah
Energy	:	317 Wh
Weight	:	Approx. 3.2 kg

- 13.5 Ah / 486 Wh

Voltage	:	36 V
Capacity	:	13.5 Ah
Energy	:	486 Wh
Weight	:	Approx. 4.0 kg

12 Ah / 432 Wh      18 Ah / 648 Wh



15 Ah / 540 Wh



## Triangle

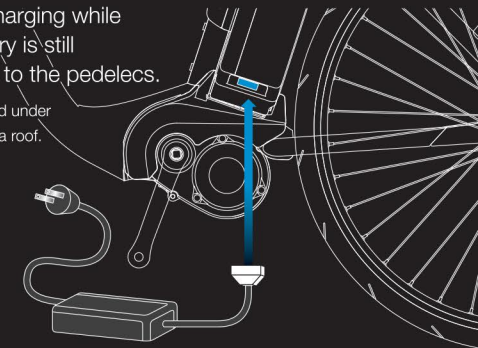
Sporty type that attaches to the down tube.

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

## Battery Charging on Vehicle

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

Must be used under the cover of a roof.

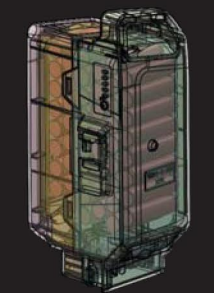


## Charger



	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

## 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.



# Rear Hub Motor Unit System

(Pedelec & Moped)

The rear hub motor unit system is suitable for multi-gear sports models.

Try a sporty styled pedelecs with the Panasonic rear hub motor unit.  
With added power assistance, take sports cycling to the next exciting level.

## Motor



### For Pedelec

This pedelec model enables the user to enjoy both physical and assisted pedaling.

Motor diameter	: 141mm
Over-Locknut Dimension	: 155mm
Weight	: 2.7kg
Rating voltage	: 46.8V
Output (Rating/Max.)	: 250W/600W
Output Torque (Rating/Max.)	: 15Nm/40Nm
Spoke PCD	: 129mm

### For Low Performance Moped

A low performance moped motor that offers comfort and speed.

Motor diameter	: 208mm
Over-Locknut Dimension	: 155mm
Weight	: 5.2kg (Excluding gear and disc)
Rating voltage	: 46.8V
Output (Rating/Max.)	: 500W/650W
Output Torque (Rating/Max.)	: 15Nm/45Nm
Spoke PCD	: 196mm

## Battery



### 46.8V Triangle Type (12Ah / 562Wh)

Voltage	: 46.8 V
Capacity	: 12 Ah
Energy	: 562 Wh
Weight	: Approx. 4.2 kg

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

OR



### 46.8V Rear Carrier Type (8.8Ah / 412Wh)

Voltage	: 46.8 V
Capacity	: 8.8 Ah
Energy	: 412 Wh
Weight	: Approx. 3.7 kg

## Console



### 46.8V Side LCD Console

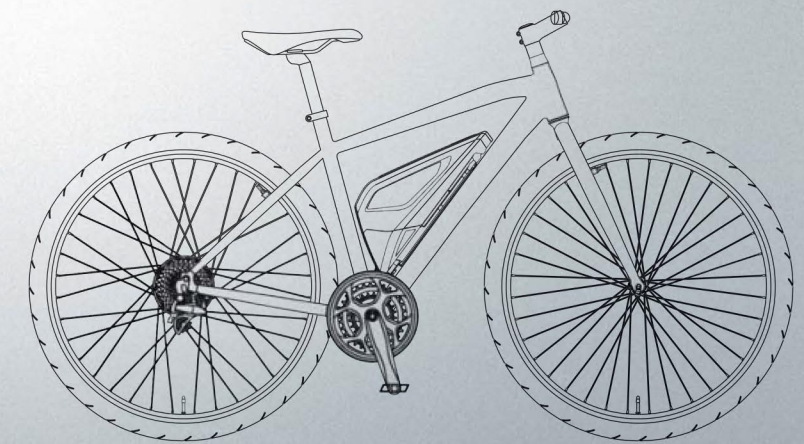
Indication : Battery Charge Level, Speed, Electric Consumption, Generative  
Information : Trip Meter / Average Speed  
Max Speed / Odometer / Rest Riding Distance

## Charger



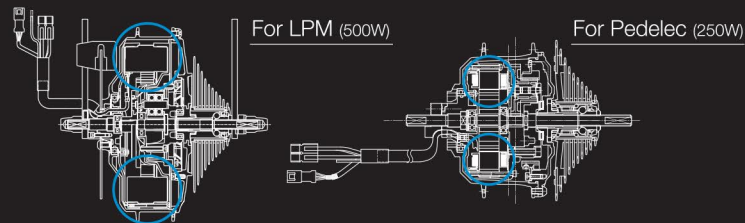
### Charger for 46.8V

Charging current	: 2A
Input Voltage	: AC 220-240V
Charging time until 100%	: Approx. 6 hours (8.8Ah battery)
Charging time until 80%	: Approx. 4 hours (8.8Ah battery)
Dimension (mm)	: 170 x 90 x 50
Weight	: 930 g



## Efficient Planetary Gears

Panasonic motors have high-efficiency planetary gears installed to provide compact motor size and high torque.



## Heat Management

Circuit board separated from motor



\*The circuit board (in particular its field-effect transistors) is a major heat source

Moved from motor into the control box

## Regeneration Capability



When braking or going downhill, braking energy is converted into electricity. Functions when in Generate Mode and Auto Mode.

### Auto Mode

Panasonic Original

The regenerative charging function is automatically initiated when entering a downward slope, without the need to engage the brakes. The resistance (i.e. charging rate and braking force) is adjusted according to the slope gradient, allowing control of speed.

\*Patent registered in Japan.

