

## Precautions for Safe Use

- To use the battery safely and properly, be sure to read the instruction manual before use.

### Danger

- For stationary batteries, ensure that the room is well ventilated so that the hydrogen concentration is 0.8 % or less. Failure to do so may cause fire or explosion.
- Do not install the battery in a poorly-ventilated area where the hydrogen concentration becomes more than 0.8 % or near open flame. Doing so may cause fire or explosion.

### Caution

- The service temperature range of the battery is from -15 to 45 °C. Using the battery outside this range may accelerate deterioration or cause the battery to freeze or overheat, resulting in damage or deformation.
- Do not use this battery where it is exposed to direct sunlight. Doing so may cause the parts of the battery to deteriorate.
- Do not expose the battery to water or seawater. Doing so may cause damage to the battery or fire, or cause the terminals or connecting plates to corrode.
- Do not use the battery near a heat source. Doing so may cause damage to the battery or cause the battery life to shorten.
- Do not use the battery in dusty areas. Doing so may cause a short-circuit.
- Charge the battery under the charging conditions recommended by Furukawa Battery. Failure to do so may result in insufficient charging, electrolyte leakage, temperature rise, explosion, deterioration in performance, or reduced service life.
- Ensure that the maximum discharge current is not exceeded for more than 1 minute for 3 C<sub>10</sub>A or for more than 5 seconds for 6 C<sub>10</sub>A. Failure to do so may cause damage to the battery.
- Periodically inspect the battery. If the results deviate from the standards specified in the instruction manual, follow the steps in the instruction manual. Using the battery with such deviations may cause damage to the battery, or burnout.



ISO9001 certified  
JQA-1118



ISO14001 certified  
JQA-EM0380

\*Actual colors may differ slightly from those in the photo due to printing limitations.

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Hybrid long-life lead-acid energy storage device

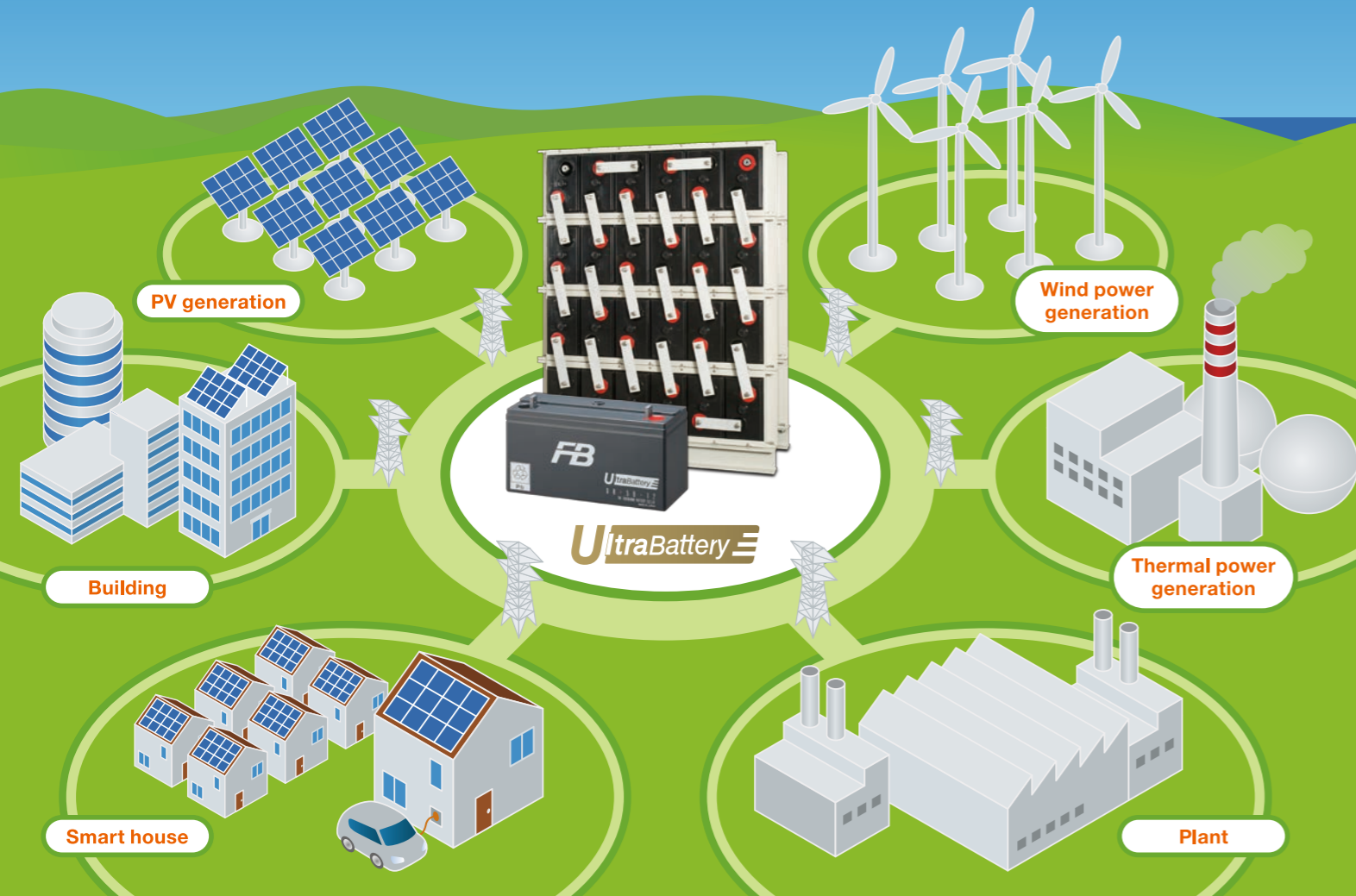
# UltraBattery®



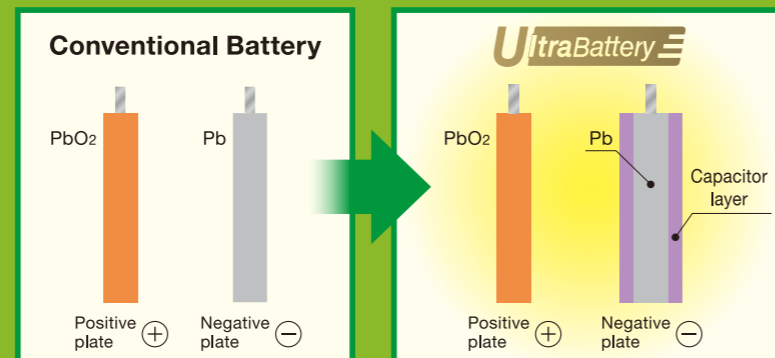
# UltraBattery® is a long life & high performance battery optimized for effective use of renewable energy

- Improved cycle life
- Enabled long life in PSOC (Partial State of Charge)
- Improved charge acceptance
- Unit configuration for stacked installation
- A subsystem is available with BMU\* produced by Furukawa.

\*BMU: Battery Monitoring Unit



The capacitor layer on the negative plate surface enables a significant improvement in battery performance.



## UB-50-12

### Main Specifications

Type		UB-50-12	
Nominal voltage		12 V	
Rated capacity (10 HR)		50 Ah	
Nominal energy capacity		600 Wh	
Capacity (25 °C) Cut-off voltage : 1.80 V/cell	0.1 C <sub>10</sub> A discharge	50 Ah	
	0.23 C <sub>10</sub> A discharge	40 Ah	
	0.6 C <sub>10</sub> A discharge	30 Ah	
	1.0 C <sub>10</sub> A discharge	25 Ah	
Single battery	Dimensions (approx.)	Height	220 mm
		Width	128 mm
		Length	363 mm
	Weight (approx.)	22 kg	

### Main Performances

Estimated life (25 °C) The estimated life (number of cycles) is not a guaranteed value.	Depth of discharge (DOD)*	70 %
	Number of cycles	4,000 cycles
	Above conditions (recommended by Furukawa)	Discharge: within 1.0 C <sub>10</sub> A Charge: Multi-step charging or CC+CV

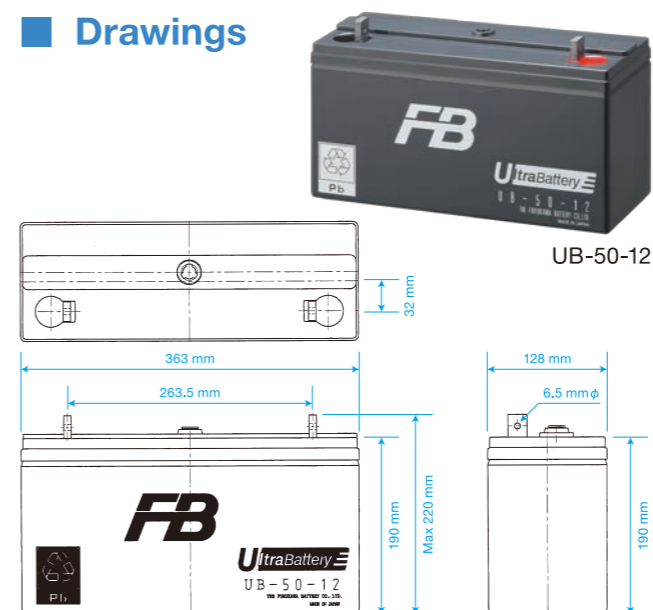
\*DOD for 1.0 C<sub>10</sub>A discharge capacity (25 Ah)

Upper and lower limit voltage	Upper limit of charge voltage	14.22 V (2.37 V/cell)
	Lower limit of discharge voltage	10.80 V (1.80 V/cell)

Maximum current at continuous operation	Charge	0.5 C <sub>10</sub> A
	Discharge	1.0 C <sub>10</sub> A

Operating temperature range	Charge	0 ~ 40 °C
	Discharge	-15 ~ 45 °C
	Storage	-15 ~ 40 °C

### Drawings



### Example of Installation



# UB-1000

## Main Specifications

Type		UB-1000	
Nominal voltage		2 V	
Rated capacity (10 HR)		1000 Ah	
Nominal energy capacity		2 kWh	
Capacity (25 °C) Cut-off voltage : 1.80 V/cell	0.1 C <sub>10</sub> A discharge	1000 Ah	
	0.16 C <sub>10</sub> A discharge	850 Ah	
	0.23 C <sub>10</sub> A discharge	750 Ah	
	0.4 C <sub>10</sub> A discharge	600 Ah	
Single cell	Dimensions (approx.)	Height	508 mm
		Width	172 mm
		Length	303 mm
	Weight (approx.)	73 kg	

Unit Type		UB-1000-12
Number of cells for 1 unit		6 cells
Voltage		12 V
Capacity (10 HR)		1000 Ah
Nominal energy capacity		12 kWh
Dimensions (approx.)	Height	337 mm
	Width	1,241 mm
	Length	505 mm
Weight (approx.)		500 kg
Gravimetric energy density (approx.)		24 Wh/kg
Volumetric energy density (approx.)		57 Wh/m <sup>3</sup>
Floor loading (approx.)		798 kg/m <sup>2</sup>

## Main Performances

Estimated life (25 °C) The estimated life (number of cycles) is not a guaranteed value.	Depth of discharge (DOD)*	70 %
	Number of cycles	4,500 cycles
	Above conditions (recommended by Furukawa)	Discharge: within 0.23 C <sub>10</sub> A Charge: Multi-step charging or CC+CV

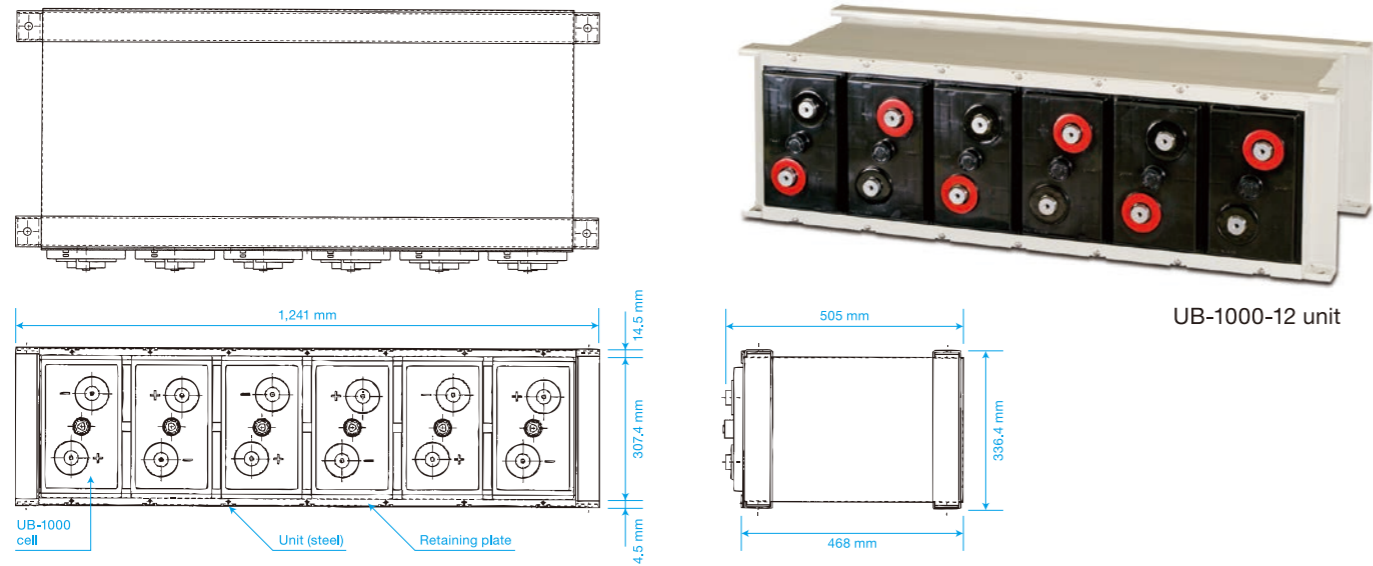
\*DOD for 0.23 C<sub>10</sub>A discharge capacity (750 Ah)

Upper and lower limit voltage	Upper limit of charge voltage	2.37 V/cell
	Lower limit of discharge voltage	1.80 V/cell

Maximum current at continuous operation	Charge	0.4 C <sub>10</sub> A
	Discharge	0.6 C <sub>10</sub> A

Operating temperature range	Charge	0 ~ 40 °C
	Discharge	-15 ~ 45 °C
	Storage	-15 ~ 40 °C

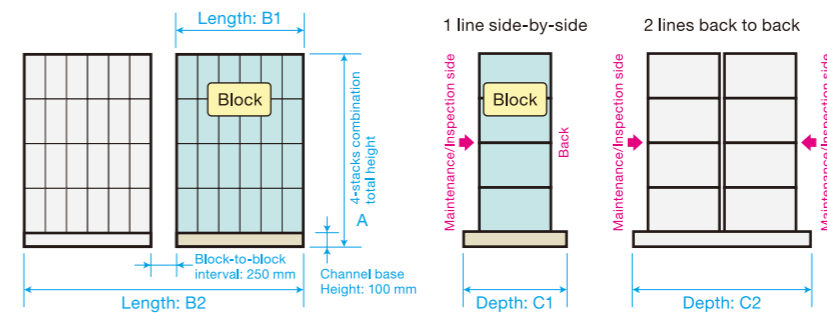
## Drawings



## Multi-unit Battery Combinations (Example)

Combination	Cell (s)	UB-1000-12 unit (s)	Block (s)	Nominal voltage of combined batteries (V)	Nominal energy capacity (kWh)	Outer dimensions of combined batteries (approx. mm)					Weight (approx. kg)	Floor loading (approx. kg/m <sup>2</sup> )
						Total height: A	Length: B1	Length: B2	Depth: C1	Depth: C2		
4-stacks	24	4	1	48	48	1,446	1,241	—	560	—	2,050	2,950
4-stacks 1 line side by side	48	8	2	96	96	1,446	—	2,732	560	—	4,100	2,950
4-stacks 2 lines back to back	48	8	2	96	96	1,446	1,241	—	—	1,075	4,100	3,070

## Diagrams of Combined Multi-unit Batteries



UB-1000-12 unit  
4-stacks

## Remarks

- A combination of stacked multiple units is represented as one block.
- The standard block for Furukawa is a four-stack combination.  
(Earthquake-resistant strength: static horizontal acceleration 1 G or below, static vertical acceleration 0.5 G or below)
- External dimensions given in the table are a reference for our standard product.
- The total height does not include the terminal.
- The total height includes the channel base (100 mm).
- Blocks are separated by 250 mm in horizontal installation.
- Larger capacity achieved by parallel installation.
- For customized installation and capacity, please contact us.

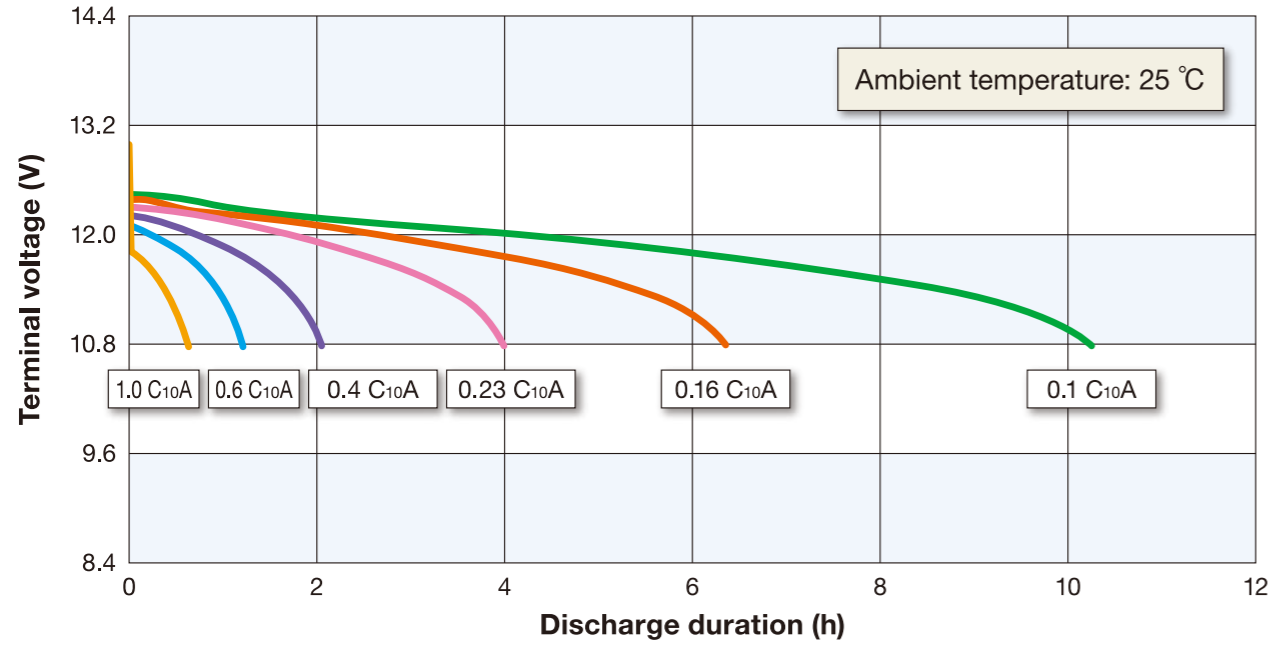
## Example of Installation

300 kW Battery Energy Storage System	
Battery pack	168 cells x 2 parallels
Nominal voltage	336 V
Nominal energy capacity	672 kWh
Maximum output power of PCS	300 kW

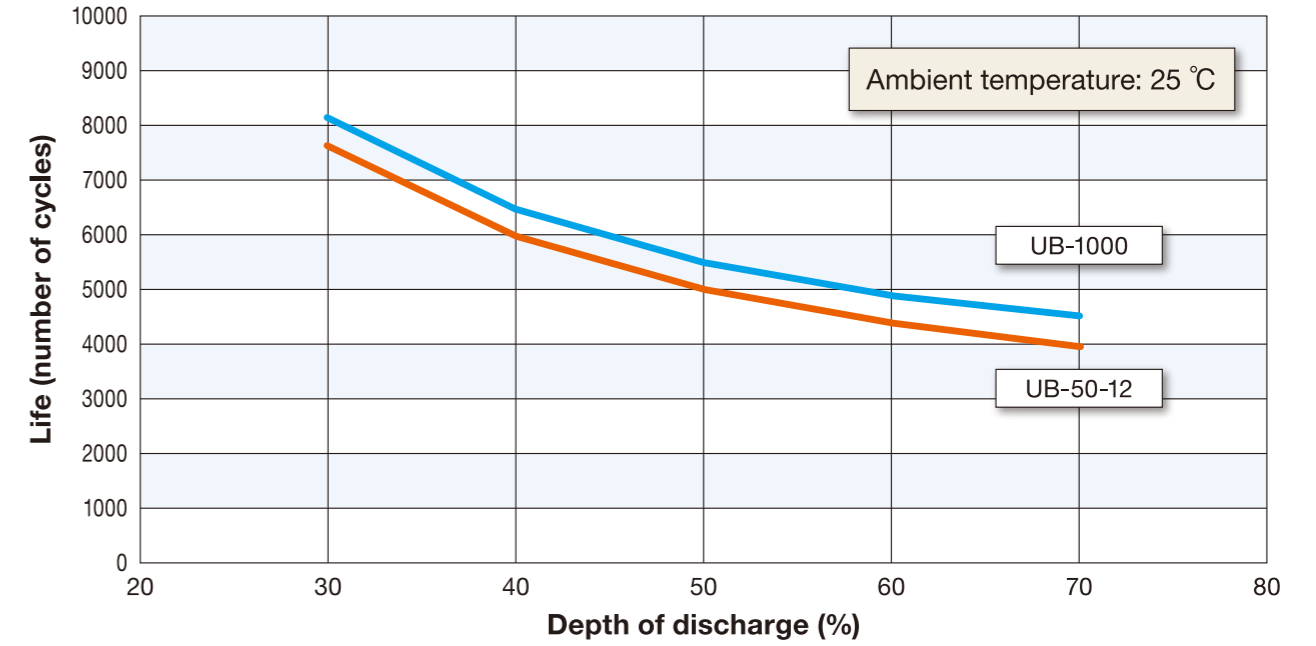


# Main Characteristics

## UB-50-12 Discharge Characteristic (Example)

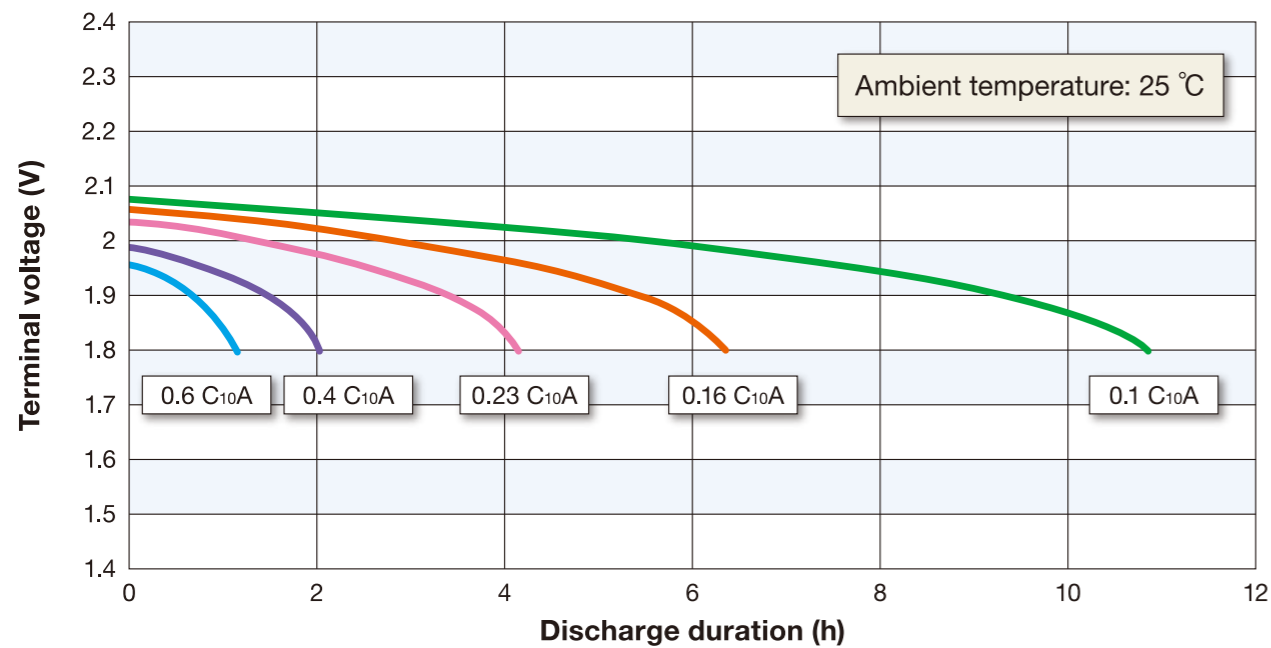


## Relationship between Depth of Discharge and Life (Example)

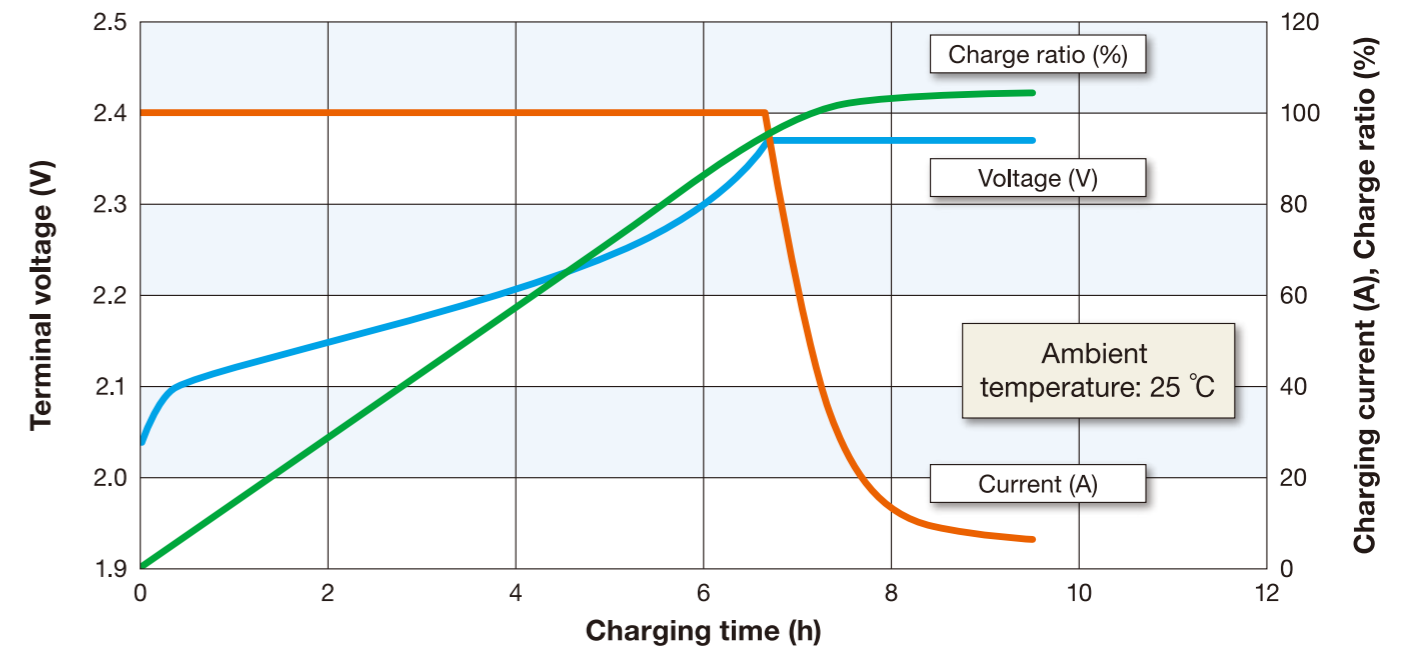


Note 1) Depth of discharge of UB-1000 is ratio for 0.23 C<sub>10</sub>A capacity.  
 Note 2) Depth of discharge of UB-50-12 is ratio for 1.0 C<sub>10</sub>A capacity  
 Note 3) Battery life, which widely varies depending on operating temperature, use, and other conditions, is not guaranteed value.

## UB-1000 Discharge Characteristic (Example)



## Continuous Current/Voltage Charge Characteristics of UB-1000 SOC 30 % (Example)



[Test conditions] Charging current: 0.1 C<sub>10</sub>A . Charging voltage: 2.37 V/cell , SOC before test: 30 % ,  
 Ambient temperature: 25 °C , Battery: UB-1000  
 \*SOC: State of Charge