

# Nickel-Metal Hydride Batteries



**July 2024**

**Panasonic Energy Co., Ltd.**

This data in this document is for descriptive purposes only and is not intended to make or imply any guarantee or warranty.

# Features



## 1. Wide range of operating temperature

Enables to use under severe condition from low to high temperature

## 2. Eco-friendly

High recyclable, enables to be repeatedly charged and discharged

## 3. Suitable for replacing Ni-Cd batteries

Achieves longer lifetime than Ni-Cd batteries

# Market Sectors

✓ Nickel-Metal Hydride Batteries are mainly used in automotive industry, Infrastructure industry.

## Automotive



Automotive electric component



Drive recorder



## Infrastructure



Solar street light



Ocean buoy



Elevator



Emergency / Guidance light



## Others



Medical device



Electric power tool / Home Appliance

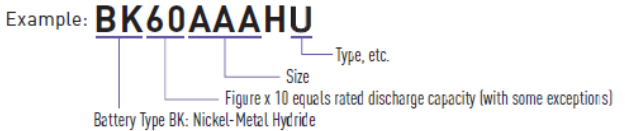


# Lineup

		High-Current Discharge	Rapid Charging*1	Ultra-Rapid Charging*2	High Temp. (60 °C) Recharging*3	High Temp. (75 °C) Recharging*3	Long Life*4
Nickel-Metal Hydride Batteries	<b>U</b> Infrastructure Backup (Long-life Type)		●		●	●	●
	<b>H</b> Infrastructure Backup (General Type)		●		●		●
	<b>PH</b> Infrastructure Backup (High-rate Discharge Type)	●	●		●		●
	<b>V</b> Large-type for Infrastructure Applications	●			●		●
	<b>W</b> Automotive Backup		●		●		●
	<b>B</b> Button Top		●				
	<b>N</b> Standard		●				
	<b>P</b> High-rate Discharge	●	●	●			

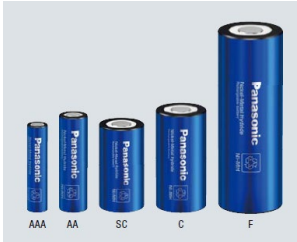
\*1 1-2 hours (dT/dt value)  
 \*2 Within 1 hour (Step control charge system)  
 Note: for charge specification, please contact Panasonic.  
 \*3 Standard model: 0-40°C  
 \*4 Approx. 2,000 cycle (under Panasonic recommended charge/discharge condition)

■ Example  
 Nickel-Metal Hydride Battery Model-Number Composition



- Size
- AAA
  - AA
  - A
  - SC
  - C
  - F

# U Infrastructure Backup (Long-life Type)



## Features

- Long 8-10 operational life ※2
- Excellent recharging performance in high temperature (up to 75 °C)
- High rate discharge (3-5It discharge/20° C)  
\* BK60AAAHU: Max. discharge current is 1It
- Suitable for replacing Ni-Cd batteries

## Applications

Emergency lights, guidance lights, LED lights, wireless base stations, servers, elevators, ATM, POS, vending machines, medical devices, etc

Size	Model No.	Nominal voltage (V)	Discharge capacity (mAh)*1		Dimensions with tube (mm)		Mass (g)	Operating temperature range	
			Rated (min.)	Average (typ.)	Diameter	Height		Charge	Discharge
NEW AAA	BK60AAAHU	1.2	500	550	10.5 +0/-0.7	44.5 +0/-1.5	12	-10 °C to 75 °C	-20 °C to 75 °C
AA	BK120AAAHU		1,200	1,280	14.5 +0/-0.7	50.5 +0/-1.5	24	-20 °C to 75 °C	
NEW SC	BK220SCHU		2,200	2,300	23.0 +0/-1.0	43.0 +0/-1.5	52	-20 °C to 75 °C	
C	BK310CHU		3,100	3,300	25.8 +0/-1.0	50.0 +0/-2.0	78	-20 °C to 75 °C	
F	BK1100FHU		11,000	12,000	33.0 +0/-1.0	91.0 +0/-2.5	245	-20 °C to 85 °C**3	

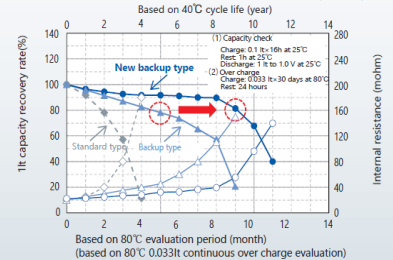
- \*1. 0.2It discharge capacity after charging at 0.1It for 16 hours
- \*2. Lifespan compared to Panasonic standard type battery life cycle(3-5 years) charged using intermittent charging method
- \*3. Please consult Panasonic when anticipating usage in operating temperature from 75 to 85°C  
Note: 1It(Ah) = rated capacity (Ah)/(hr.)

## Long life (Trickle charging method)

Trickle charging is completely compatible with Ni-Cd battery

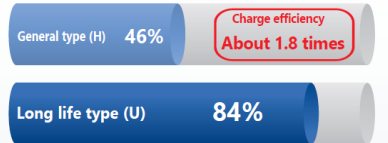


Example of estimated life by accelerated life evaluation

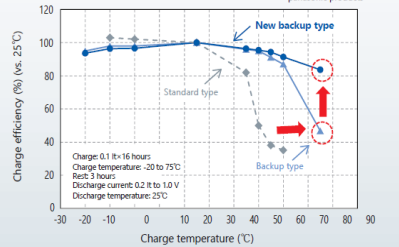


## Deliver excellent charge characteristics at high temperature (75°C)

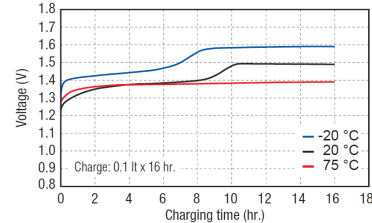
Operating temperature is updated from 60 to 75°C



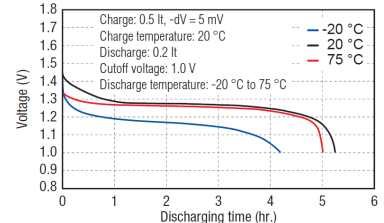
Charge characteristics



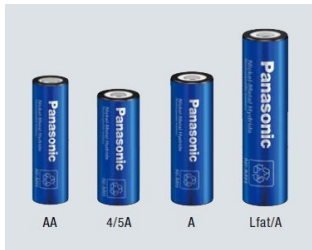
## Charge characteristics



## Discharge characteristics



# H Infrastructure Backup (Standard type)



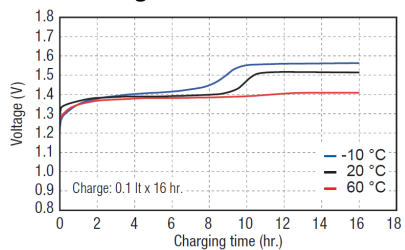
### Features

- Long 4-6 years operational life ※2
- Enables to use in a wide range of temperature(-10 to 60 °C)
- Suitable for replacing Ni-Cd batteries

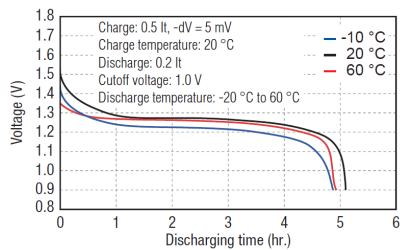
### Applications

Emergency lights, guidance lights, LED lights, wireless based stations, servers, elevators, ATM, POS, vending machines, medical devices, etc

### ■ Charge characteristics



### ■ Discharge characteristics



Size	Model No.	Nominal voltage (V)	Discharge capacity (mAh)*1		Dimensions with tube (mm)		Mass (g)	Operating temperature range	
			Rated (min.)	Average (typ.)	Diameter	Height		Charge	Discharge
AA	BK70AAH	1.2	700	750	14.5 +0/-0.7	49.0 +0/-1.5	18	-10 °C to 60 °C	-10 °C to 60 °C
AA	BK110AAH		1,100	1,180	14.5 +0/-0.7	50.5 +0/-1.5	24		
AA	BK150AAH		1,450	1,530			25		
4/5A	BK160AH		1,600	1,720	17.0 +0/-0.7	43.0 +0/-1.5	29		
A	BK210AH		1,900	2,050	17.0 +0/-0.7	50.0 +0/-2.0	35		
Lfat/A	BK370AH		3,500	3,700	18.2 +0/-0.7	67.5 +0/-1.5	60		

\*1. 0.2It discharge capacity after charging at 0.1It for 16 hours  
 \*2. Lifespan compared to Panasonic standard type battery life cycle(3-5 years) charged using intermittent charging method  
 Note: 1It(A) = rated capacity (Ah)/(hr.)

# PH Infrastructure Backup (High rate Discharge Type)



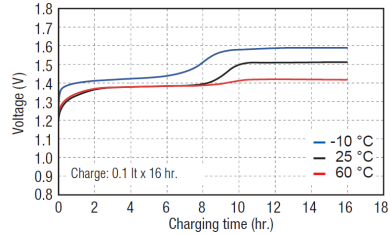
### Features

- Long 4-6 years operational life <sup>※2</sup>
- High rate discharge (5It discharge/20 °C)
- Suitable for replacing Ni-Cd batteries

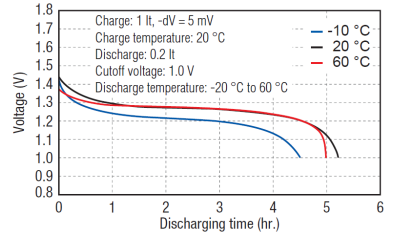
### Applications

Elevators, AGV, UPS, ATM, POS, vending machines, medical devices, etc

### ■ Charge characteristics



### ■ Discharge characteristics



Size	Model No.	Nominal voltage (V)	Discharge capacity (mAh)*1		Dimensions with tube (mm)		Mass (g)	Operating temperature range	
			Rated (min.)	Average (typ.)	Diameter	Height		Charge	Discharge
SC	BK250SCH	1.2	2,500	2,650	23.0 +0/-1.0	43.0 +0/-1.5	53	-10 °C to 60 °C	-10 °C to 60 °C
Lfat/A	BK330APH		3,200	3,300	18.2 +0/-0.7	67.5 +0/-1.5			

\*1. 0.2It discharge capacity after charging at 0.1It for 16 hours

\*2. Lifespan compared to Panasonic standard type battery life cycle(3-5 years) charged using intermittent charging method

Note: 1It(A) = rated capacity (Ah)/(hr.)

# Large-type for Infrastructure Applications



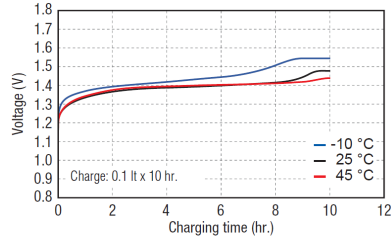
### Features

- Designed for extra-large power capacity
- Highly efficient power supply even in low temperature
- 5-stage LED indicates remaining battery life(BK-10V10T)

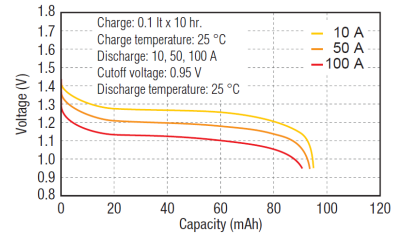
### Applications

AGV, rail vehicle, wireless base stations, UPS, etc

### ■ Charge characteristics (e.g. BK-10V1S)



### ■ Discharge characteristics (e.g. BK-10T1S)



Size	Model No.	Nominal voltage (V)	Discharge capacity (mAh)*1		Dimensions with stud bolts (mm)			Mass (g)	Operating temperature range	
			Rated (min.)	Average (typ.)	Diameter	Height	Charge		Discharge	
V	BK-10V1S	1.2	90,000	95,000	62.6 +1.0/-1.0	188.7 +1.0/-1.0	1,700	-20 °C to 60 °C	-20 °C to 60 °C	
Size	Model No.	Nominal voltage (V)	Rated (min.)	Maximum continuous discharge current (A)	Dimensions (mm)			Mass (kg)	Operating temperature range	
					Width	Depth	Height		Charge	Discharge
-	BK-10V10T	12	90,000	100	428	159	270	23	-20 °C to 60 °C	-20 °C to 60 °C

\*1. 0.2lt discharge capacity after charging at 0.1lt for 16 hours  
 Note: 1lt(A) = rated capacity (Ah)/(hr.)



# W Automotive Backup



### Features

- Enables to operate in a wide range of temperature(-30 to 85 °C)
- Installable in severe conditions because electrolyte solution is aqueous
- Enables to control charge, and easy to do health check

### Applications

TCU, eCall, drive recorder, anti-theft security systems, etc

Size	Model No.	Nominal voltage (V)	Discharge capacity (mAh)*1		Dimensions with tube (mm)		Mass (g)	Operating temperature range	
			Rated (min.)	Average (typ.)	Diameter	Height		Charge	Discharge
NEW AAA	BK60AAAWS	1.2	500	550	10.5 +0/-0.7	44.5 +0/-1.5	11	-20 °C to 45 °C*2	-20 °C to 60 °C*4 -30 °C to 85 °C*5
NEW AA	BK120AAWS							-20 °C to 60 °C*3	-30 °C to 60 °C*4 -40 °C to 85 °C*5

- \*1. 0.2It discharge capacity after charging at 0.1It for 16 hours
  - \*2. Temperature for rapid charge
  - \*3. Temperature for standard charge
  - \*4. Recommended temperature
  - \*5. It depends on usage conditions. Please contact Panasonic.
- Note: 1It(A) = rated capacity (Ah)/(hr.)

\* Please consult Panasonic about -40°C efficient discharge of BK120AAWS.

Enables to use in a wide range of temperature(-40 to 85 °C)

[Standard type(N)] -20~65°C

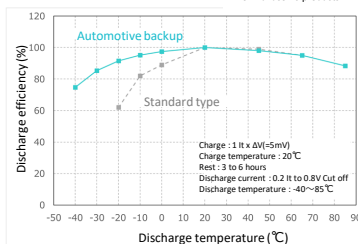
0.2It

Discharge

[Automotive backup(W)] -40~85°C

■ Discharge characteristics

\*Comparison is based on Panasonic products



Efficient discharge in low temperature (-30°C)

[Standard type(N)] -10~65°C

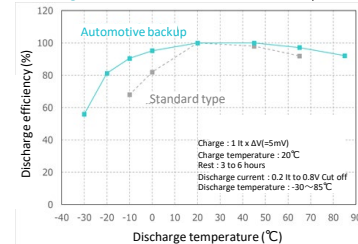
1 It

Discharge

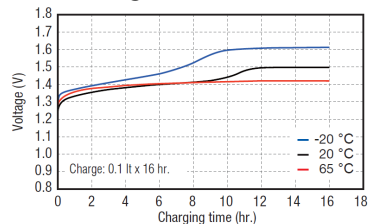
[Automotive backup(W)] -30~85°C

■ Discharge characteristics

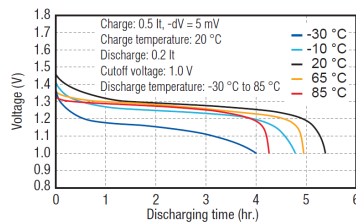
\*Comparison is based on Panasonic products



### ■ Charge characteristics



### ■ Discharge characteristics



# B Button Top



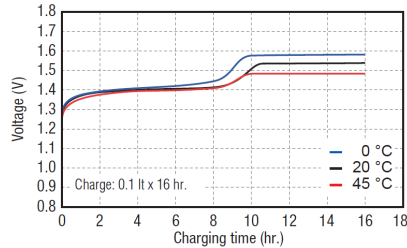
### Features

- Long charge/discharge cycle life about 1800 times<sup>※2</sup>
- Low self discharge and long storage life
- Excellent temperature resistance especially in low temperature

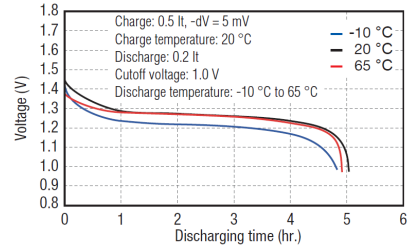
### Applications

Electric toothbrushes, electric shavers, remote controllers, etc

### ■ Charge characteristics



### ■ Discharge characteristics



Size	Model No.	Nominal voltage (V)	Discharge capacity (mAh) <sup>*1</sup>		Dimensions with tube (mm)		Mass (g)	Operating temperature range	
			Rated (min.)	Average (typ.)	Diameter	Height		Charge	Discharge
AAA <sup>*3</sup>	BK80AAAB	1.2	750	780	10.5 +0/-0.7	44.5 +0/-1.0	12	0 °C to 45 °C	-10 °C to 65 °C
AA <sup>*4</sup>	BK200AAB		1,900	1,980	14.5 +0/-0.7	50.5 +0/-1.0			

\*1. 0.2It discharge capacity after charging at 0.1It for 16 hours

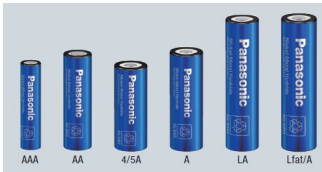
\*2. Measured under condition complying with JIS C8708 2013(7.5.1.1). Actual capacity depends on usage condition.

\*3. AAA size compatible

\*4. AA size compatible

Note: 1It(A) = rated capacity (Ah)/(hr.)

# N Standard



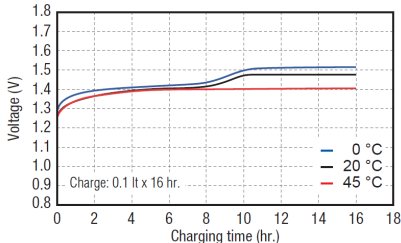
### Features

- High safety and reliability
- Wide product range

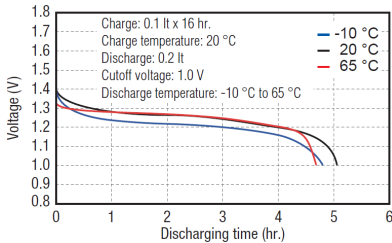
### Applications

Radios, intercommunication systems, cordless phones, medical devices, etc

### Charge characteristics



### Discharge characteristics



Size	Model No.	Nominal voltage (V)	Discharge capacity (mAh)*1		Dimensions with tube (mm)		Mass (g)	Operating temperature range			
			Rated (min.)	Average (typ.)	Diameter	Height		Charge	Discharge		
AAA	BK70AAAJ	1.2	700	730	10.5 +0/-0.7	44.5 +0/-1.5	12	0 °C to 45 °C	-10 °C to 65 °C		
	BK70AA			780		49.0 +0/-1.5				18	
AA	BK110AAO		1,100	1,180	14.5 +0/-0.7	50.5 +0/-1.5	24				
	BK150AA		1,500	1,580			25				
	BK200AAP		1,900	1,980			28				
4/5A	BK200A		2,000	2,040		43.0 +0/-1.5	32				
A	BK210A		2,100	2,200	17.0 +0/-0.7	50.0 +0/-2.0	36				
	BK250A		2,450	2,600			37				
LA	BK380A		3,700	3,800		67.0 +0/-2.0	53				-30 °C to 65 °C
Lfat/A	BK450A		4,200	4,500	18.2 +0/-0.7	67.5 +0/-1.5	61				-10 °C to 65 °C

\*1. 0.2It discharge capacity after charging at 0.1It for 16 hours  
 Note: 1It(A) = rated capacity (Ah)/(hr.)

# P High-rate Discharge



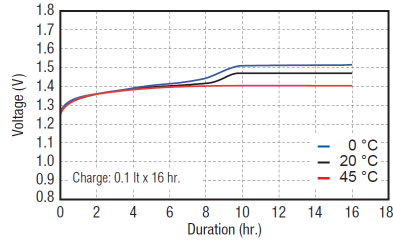
### Features

- Excellent high current discharge characteristics
- Rapid charging capacity

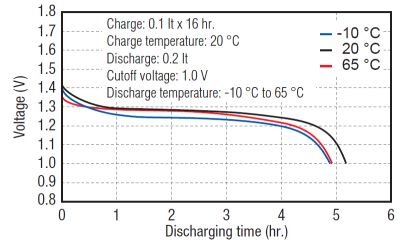
### Applications

Power tools, cordless cleaners, electric toys (radio controlled cars), etc

### Charge characteristics



### Discharge characteristics



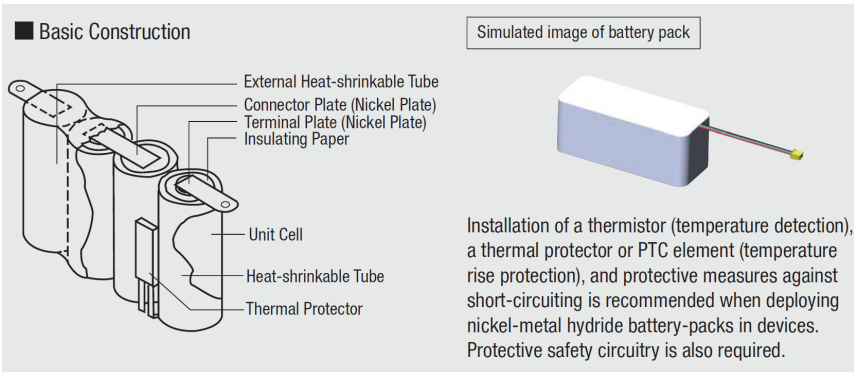
Size	Model No.	Nominal voltage (V)	Discharge capacity (mAh)*1		Dimensions with tube (mm)		Mass (g)	Operating temperature range	
			Rated (min.)	Average (typ.)	Diameter	Height		Charge	Discharge
SC	BK260SCP	1.2	2,450	2,700	23.0 +0/-1.0	43.0 +0/-1.5	55	0 °C to 45 °C	-10 °C to 65 °C
	BK300SCP		2,800	3,050					

\*1. 0.2It discharge capacity after charging at 0.1It for 16 hours

Note: 1It(A) = rated capacity (Ah)/(hr.)

Please use appropriate voltage and temperature management to control battery temperature near the end of rapid charging

# Battery Pack



- ✓ When battery packs are installed, the battery type, number of cells, pack shape, and constituent parts are determined by the application. Considerations include voltage and current; charging specifications; available space; and usage conditions. We design and manufacture to the most common industrial applications to best meet customer needs while maintaining safety, quality, and reliability as our central focus.



- ✓ Compared to the consumer market, a higher standard of quality and reliability is expected in industrial battery applications, particularly where batteries are intended for vehicles where harsh vibration and huge temperature fluctuations are commonplace. To ensure quality and reliability in this environment, Panasonic selects components for battery packs with utmost care and applies stringent controls for structural assembly and battery production. Suitability for automotive use is evidenced by PPAP (Production Part Approval Process) certification and IATF16949 compliance.

Please feel free to contact us

[Panasonic Energy Website for Business Products](#)

