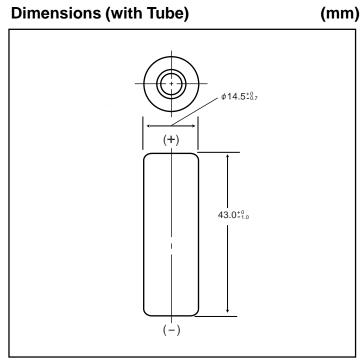
HHR120AA Cylindrical 4/5AA size (HR 15/43)



Specifications

	mm	inch
Diameter	14.5+0/-0.7	0.57+0/-0.03
Height	43.0+0/-1.0	1.69+0/-0.04
Approximate	Grams	Ounces
Weight	23	0.81

Nominal Voltage			1.2V	
Discharge Capacity*		Average**	1220	mAh
		Rated (Min.)	1150	mAh
Approx. Internal impedance at 1000Hz at charged state.		19mΩ		
CI	Charge Standard		120mA (0.1lt) x 16hrs.	
		Rapid	1200mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
ø	Charge	Standard	0°C to 45°C	32°F to 113°F
tur		Rapid	0°C to 40°C	32°F to 104°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 149°F
Am		< 1 year	-20°C to 35°C	-4°F to 95°F
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

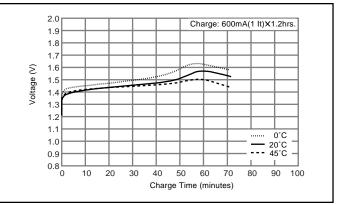
* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

** For reference only.

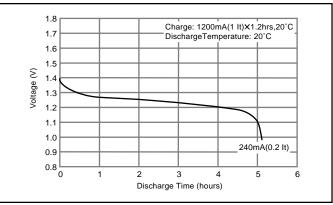
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

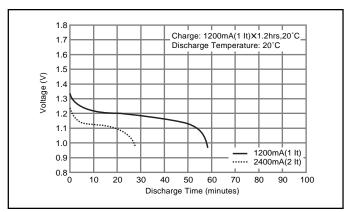
- [It] was previously expressed as [C]. [It] is an IEC standard expression Note: for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



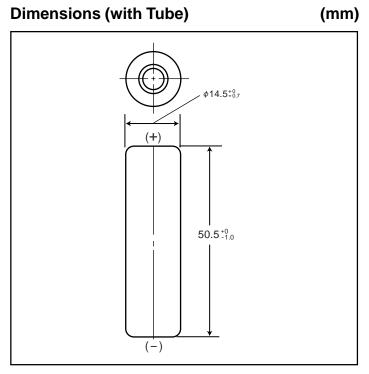
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR150AA Cylindrical AA size (HR 15/51)



Specifications

		mm	inch		
Diameter		14.5+0/-0.7	0.57+0/-0.03		
	Height	:	50.0+0/-1.0	1.97+0/-0.06	
	Approxim	ate	Grams	Ounces	
	Weight	t	26	0.92	
	Nominal V	oltage	1.:	2V	
Disc	harge	Average**	1580	mAh	
Сар	acity*	Rated (Min.) 1500	mAh	
		impedance rged state.	20	20mΩ	
CI	narge	Standard	150mA (0.1	1lt) x 16hrs.	
		Rapid	1500mA (1	It) x 1.2 hrs.	
		Standard	°C	°F	
စ	Charge	Stanuaru	0°C to 45°C	32°F to 113°F	
atur	Rapid	Rapid	0°C to 40°C	32°F to 104°F	
Ambient mperatu	Discharge		-10°C to 65°C	14°F to 149°F	
Ambient Temperature		< 1 year	-20°C to 35°C	-4°F to 95°F	
۳ ۲	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F	
		< 1 month	-20°C to 55°C	-4°F to 131°F	

* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

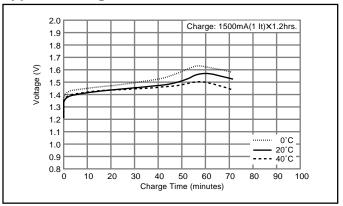
** For reference only.

nasonic

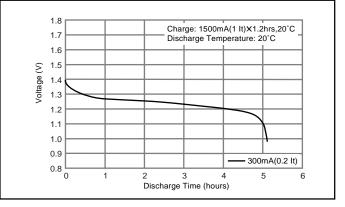
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

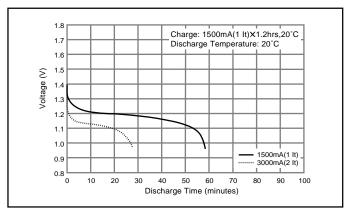
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



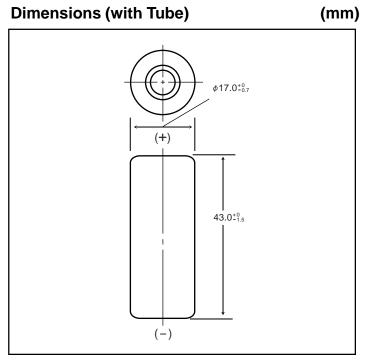
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR200A Cylindrical 4/5A size (HR 17/43)



Specifications

	mm	inch
Diameter	17.0+0/-0.7	0.67+0/-0.03
Height	43.0+0/-1.5	1.69+0/-0.06
Approximate	Grams	Ounces
Weight	32	1.13

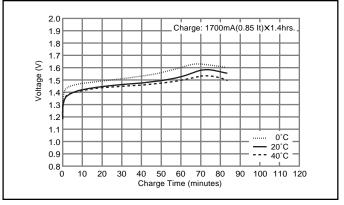
Nominal Voltage		1.2V		
Discharge Capacity*		Average**	2040 mAh	
		Rated (Min.)	2000	mAh
Approx. Internal impedance at 1000Hz at charged state.		20mΩ		
CI	Charge Standard		200mA (0.1lt) x 16hrs.	
		Rapid	2000mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
ø	Charge	Standard	0°C to 45°C	32°F to 113°F
tur		Rapid	0°C to 40°C	32°F to 104°F
bie era	Discharge		-10°C to 65°C	14°F to 149°F
Ambient Temperature		< 1 year	-20°C to 35°C	-4°F to 95°F
Te	Storage < 3 months	-20°C to 45°C	-4°F to 113°F	
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt. ** For reference only.

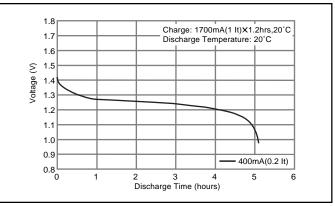
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

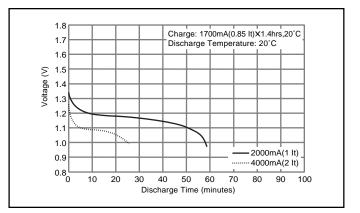
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics

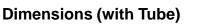


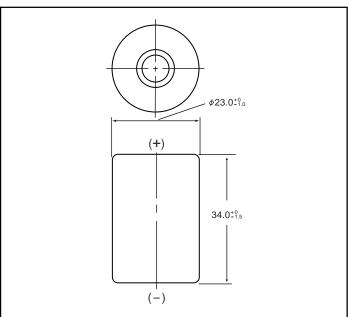


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(mm)

HHR200SCP Cylindrical 4/5SC size (HR 23/34)





Specifications

	mm	inch
Diameter	23.0+0/-0.1	0.91+0/-0.04
Height	34.0+0/-1.5	1.34+0/-0.06
Approximate	Grams	Ounces
Weight	42	1.48

	Nominal V	oltage	1.2V	
Discharge Capacity*		Average**	2100 mAh	
		Rated (Min.)	1900 mAh	
		impedance rged state.	5mΩ	
CI	Charge Standard		200mA (0.1lt) x 16hrs.	
		Rapid	2000mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
ure	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
rat	Rapid		0°C to 40°C	32°F to 104°F
dm be	Discharge		-10°C to 65°C	14°F to 149°F
Ambient Temperature	Storage	< 2 years	-20°C to 35°C	-4°F to 95°F
		< 6 months	-20°C to 45°C	-4°F to 113°F

After charging at 0.1lt for 16 hours, discharging at 0.2lt.

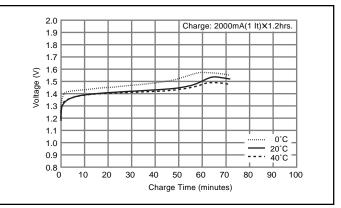
** For reference only.

Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

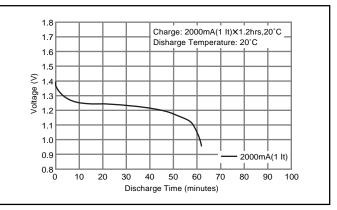
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

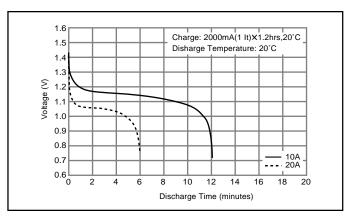
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



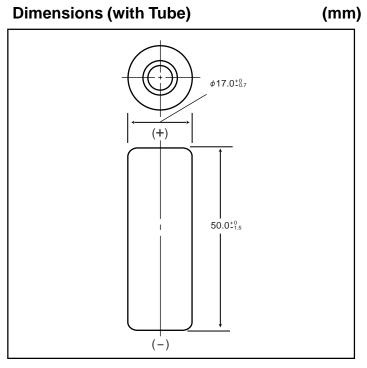
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR210A Cylindrical A size (HR 17/50)



Specifications

		mm	inch		
Diameter		17.0+0/-0.7	0.67+0/-0.03		
	Heigh	t	50.0+0/-1.5	1.97+0/-0.06	
	Approxin	nate	Grams	Ounces	
	Weigh	t	38	1.34	
	Nominal V	oltage	1.	2V	
Disc	harge	Average**	2200	mAh	
Сар	acity*	Rated (Min.)	2100	mAh	
	Approx. Internal impedance at 1000Hz at charged state.		20	20mΩ	
CI	narge	Standard	210mA (0.	1lt) x 16hrs.	
	laige	Rapid	2100mA (1	2100mA (1lt) x 1.2 hrs.	
		Cton doud	°C	°F	
e	Charge	Standard	0°C to 45°C	32°F to 113°F	
atur	Rapid		0°C to 40°C	32°F to 104°F	
Ambient mperatu	Discharge		-10°C to 65°C	14°F to 149°F	
Ambient Temperature	Am	< 1 year	-20°C to 35°C	-4°F to 95°F	
L D	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F	
		< 1 month	-20°C to 55°C	-4°F to 131°F	

* After charging at 0.1lt for 16 hours, discharging at 0.2lt. ** For reference only.

Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

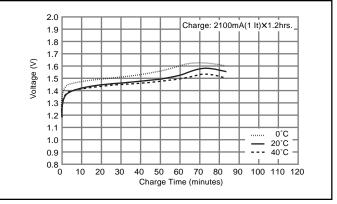
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

• [It] is the reference test current in ampres

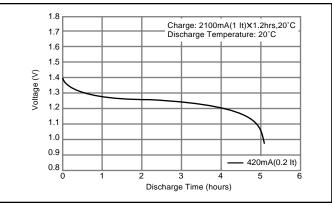
nasonic

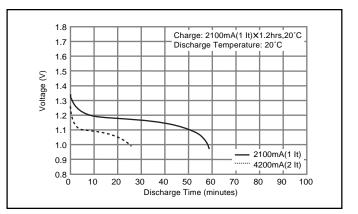
• [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics

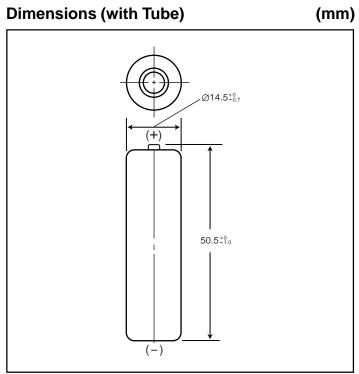




NICKEL METAL HYDRIDE HANDBOOK

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HHR210AA/B Cylindrical AA size (HR 15/51)



Specifications

	mm	inch
Diameter 14.5 +0/-0.7		0.57 +0/-0.3
Height	50.5 +0/-1.0	1.99 +0/-0.5
Approximate	Grams	Ounces
Weight	29	1.02

	Nominal Vo	ltage	1.2V	
Discharge		Average**	2080mAh	
Ca	pacity*	Rated (Min.)	2000	mAh
	ox. internal li 00Hz at chai			mΩ
C	harde	Standard	200mA (0.1lt) x 16 hrs.	
	Charge Rapid		1200mA (1lt) x 2 hrs.	
		Standard	°C	°F
e.	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
ent atur		Rapid 0°C to 40°C	0°C to 40°C	32°F to 113°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 149°F
Ar		< 1 year	-20°C to 35°C	-4°F to 95°F
	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

** For reference only.

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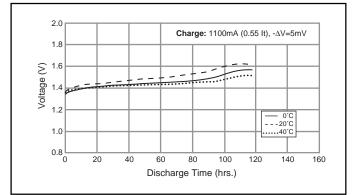
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

[It] was previously expressed as [C]. [It] is an IEC standard expression Note: for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h

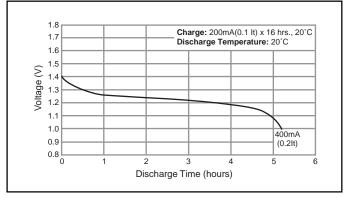
[It] is the reference test current in ampres

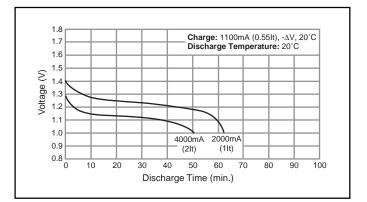
* [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



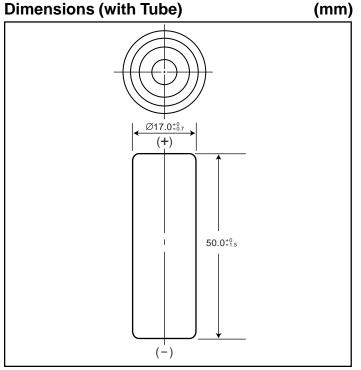
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR210AH Cylindrical A size (HR 17/50)



Specifications

			mm	inch
	Diameter		17.0+0/-0.7	0.67+0/-0.03
	Height		50.0+0/-1.5	1.97+0/-0.06
	Approximat	te	Grams	Ounces
	Weight		38	1.34
	Nominal Vo	tage	1.	2V
Dis	scharge	Average ²	2050)mAh
	pacity	Rated (Min.) 1900)mAh
	Approx. internal Impedance at 1000Hz at charged state.		20mΩ	
C	harge	Standard	210mA (0.1lt) x 16 hrs.	
	liaige	Rapid		-
		Standard	°C	۴F
	Charge	Standard	-10°C to 60°C	14°F to 140°F
nt ure		Rapid	-	-
bier erat	Discl	harge	-10°C to 60°C	14°F to 140°F
Ambient Temperature	< 1 year		-20°C to 35°C	-4°F to 95°F
Le l	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
	otorage	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 60°C	-4°F to 140°F

¹ After charging at 0.1lt for 16 hours, discharging at 0.2lt.

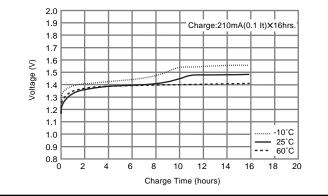
² For reference only.

Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

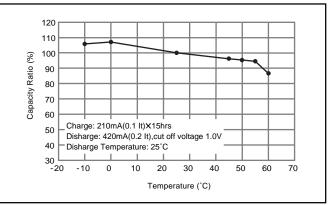
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

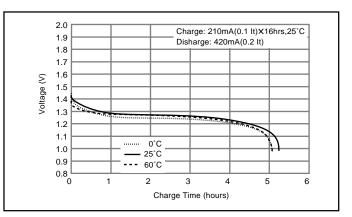
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours.
- n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics



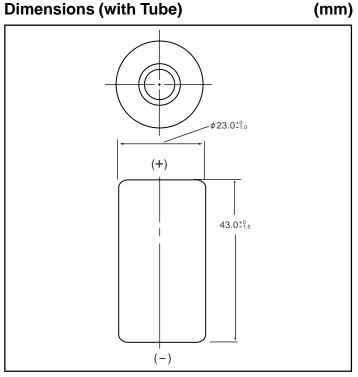


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NICKEL METAL HYDRIDE HANDBOOK

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HHR250SCH Cylindrical SC size (HR 23/43)



Specifications

	mm	inch
Diameter	23.0+0/-1.0	0.91+0/-0.04
Height	43.0+0/-1.5	1.69+0/-0.06
Approximate	Grams	Ounces
Weight	55	1.94

·				
Nominal Voltage		1.2V		
Discharge Average ²		Average ²	2650	mAh
Cap	acity	Rated (Min.)	2500	mAh
	ox. Internal impedance $5m\Omega$		nΩ	
		Standard	250mA	x 16hrs.
Charge		Rapid ³	1250mA :	x 2.4 hrs.4
		Low Rate	125mA x 32 hrs.	
		LOW Kale	83mA x 48 hrs.	
		Standard	O°	°F
	Charge		-10°C to 60°C	14°F to 140°F
ure		Rapid	-10°C to 45°C	14°F to 113°F
ien rat	Dis	charge	-10°C to 60°C	14°F to 140°F
Ambient mperatu		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F
	otorage	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 65°C	-4°F to 149°F

 $\frac{1}{2}$ After charging at 0.1lt for 16 hours, discharging at 0.2lt.

² For reference only.

³ Need specially designed control system

Control System:

dT/dt cut-off; 1 to 2°C/min

 $-\triangle V$ cut-off; $-\triangle V$ per cell = 5 to 10 mV T-control; T=65°C

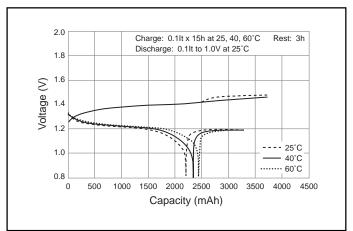
Rapid charger timer; 2.4h (at 1.25a)

Trickle timer; within 2h

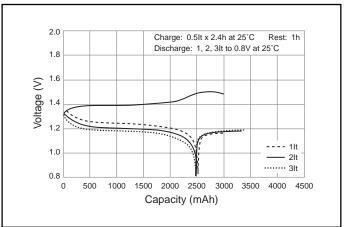
⁴ With control system

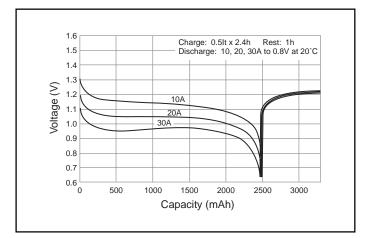
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

Typical Charge Characteristics



Typical Discharge Characteristics





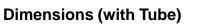
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h
 - * [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 - n = the time base [hours] for which the rated capacity is declared

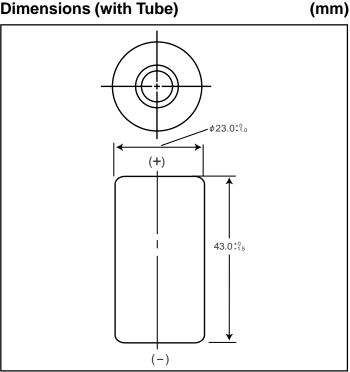
Panasonic

NICKEL METAL HYDRIDE HANDBOOK

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HHR260SCP Cylindrical SC size (HR 23/43)





Specifications

	mm	inch
Diameter	23.0+0/-1.0	0.91+0/-0.04
Height	43.0+0/-1.5	1.69+0/-0.06
Approximate	Grams	Ounces
Weight	55	1.94

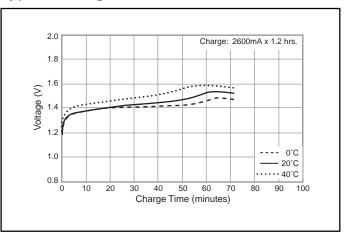
1				
Nominal Voltage		1.2V		
Discharge		Average ²	2600 mAh	
Cap	acity	Rated (Min.)	2450	mAh
Approx. Internal impedance at 1000Hz at charged state.		5mΩ		
	Standard		260mA x 16hrs.	
	Charge Rapid		2600mA x 1.2 hrs.	
		Cton doud	°C	۴F
e	Charge	Standard	0°C to 45°C	32°F to 113°F
atu	J	Rapid	10°C to 40°C	50°F to 104°F
bie	Dis	charge	-10°C to 65°C	14°F to 149°F
u A m		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

¹ After charging at 0.1lt for 16 hours, discharging at 0.2lt. ² For reference only.

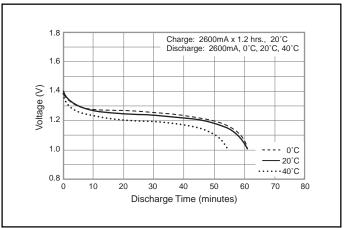
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

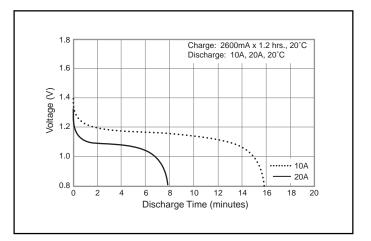
- [It] was previously expressed as [C]. [It] is an IEC standard expression Note: for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h
 - [It] is the reference test current in ampres
 - * [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 - n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics





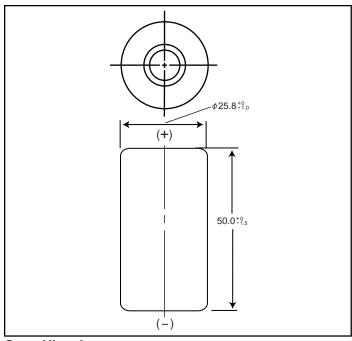
NICKEL METAL HYDRIDE HANDBOOK

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(mm)

HHR300CH Cylindrical C size (HR 26/50) for backup use





Specifications

	mm	inch
Diameter	25.8+0/-1.0	1.02+0/-0.04
Height	50.0+0/-1.5	1.97+0/-0.06
Approximate	Grams	Ounces
Weight	80	2.82

	Nominal V	oltage	1.2V	
Disc	charge	Average ²	3300 mAh	
Capacity ¹		Rated (Min.)	3100	mAh
		impedance rged state.	5mΩ	
Charge Standard Rapid ³		300mA (0.1	1 lt) x 16hrs.	
		Rapid ³	1500mA (1lt) x 2.4 hrs.4	
	La		155mA x 32 hrs. 100mA x 48 hrs.	
		Standard	۵°	°F
	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
t ure		Rapid	10°C to 40°C	32°F to 104°F
ien rati		Low Rate	-10°C to 45°C	14°F to 149°F
Ambient Temperature	Dis	charge	-10°C to 65°C	14°F to 113°F
A Ten		< 1 year	-20°C to 35°C	-4°F to 95°F
	Storage	< 3 months	-20°C to 35°C	-4°F to 95°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

¹ After charging at 0.1lt for 16 hours, discharging at 0.2lt.

² For reference only.

³ Need specially designed control system

Control System:

dT/dt cut-off; 1 to 2°C/min $-\triangle V$ cut-off; $-\triangle V$ per cell = 5 to 10 mV T-control; T=65°C

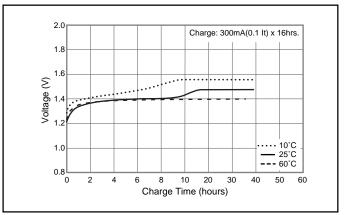
Rapid charger timer; 2.4h (at 1.25a)

Trickle timer; within 2h

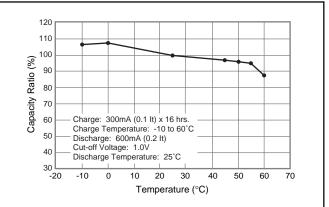
⁴ With control system

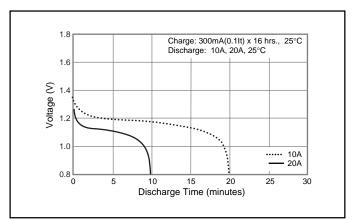
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

Typical Charge Characteristics



Typical Discharge Characteristics





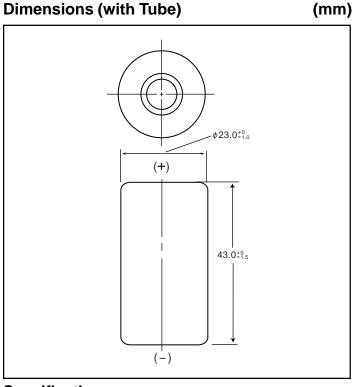
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 - n = the time base [hours] for which the rated capacity is declared

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HHR300SCP Cylindrical SC size (HR 23/43)



Specifications

	mm	inch
Diameter	23.0+0/-0.1	0.91+0/-0.04
Height	43.0+0/-1.5	1.69+0/-0.06
Approximate	Grams	Ounces
Weight	57	2.01

	Nominal V	oltage	1.2V	
Discharge Capacity*		Average**	3050 mAh	
		Rated (Min.)	2800 mAh	
		impedance rged state.	4mΩ	
CI	Charge Standa		300mA (0.1lt) x 16hrs.	
	3 -	Rapid	3000mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
ure	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
ien		Rapid	0°C to 40°C	32°F to 104°F
dm	Dis	charge	-10°C to 65°C	14°F to 149°F
Ambient Temperature	Storage	< 2 years	-20°C to 35°C	-4°F to 95°F
r Stora	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

** For reference only.

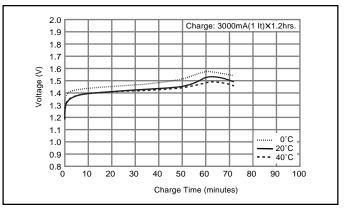
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Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

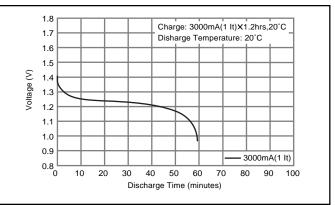
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

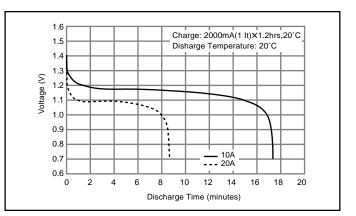
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



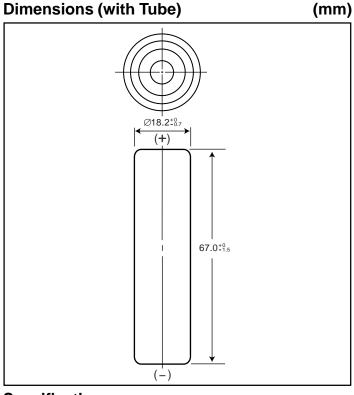
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR330APH Cylindrical L-Fat A size (HR 18/67)



Specifications

			mm	inch
Diameter		18.2+0/-0.7	0.72+0/-0.03	
	Heigh	t	67.0+0/-1.5	2.64+0/-0.06
	Approxin	nate	Grams	Ounces
	Weigh	t	60	2.12
	Nominal V	oltage	1.2	2V
Disc	harge	Average ²	3300	mAh
Cap	acity	Rated (Min.)	3200	mAh
		impedance	5.5	mΩ
at 100	00Hz at cha	rged state.		
		Standard	330mA x 16hrs.	
CI	narge	Rapid ³	1650mA x 2.4 hrs.4	
	•	Low Rate		x 32 hrs.
		Lon Hato		x 48 hrs.
		Standard	O°	°F
0	Charge		-10°C to 60°C	14°F to 140°F
n. t		Rapid	-10°C to 45°C	14°F to 113°F
ien rat	Discharge		-10°C to 60°C	14°F to 140°F
Ambient mperatu		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F
F F	Storage	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 65°C	-4°F to 149°F

After charging at 0.1lt for 16 hours, discharging at 0.2lt.

² For reference only.

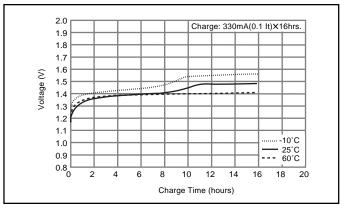
³ Need specially designed control system

Control System: dT/dt cut-off; 1 to 2°C/min $-\Delta V$ cut-off; $-\Delta V$ per cell = 5 to 10 mV T-control; T=65°C Rapid charger timer; 2.4h (at 1.25a) Trickle timer; within 2h

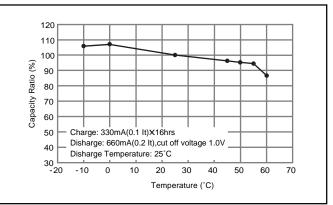
⁴ With control system

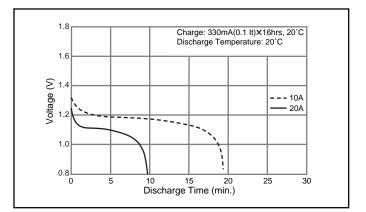
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

Typical Charge Characteristics



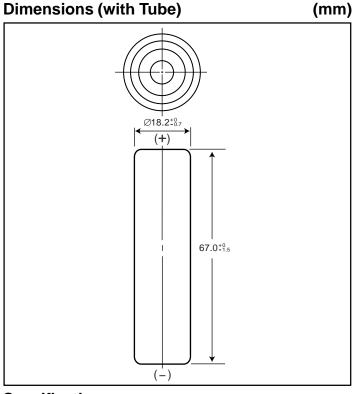
Typical Discharge Characteristics





- Note: [[It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

HHR370AH Cylindrical L-Fat A size (HR 18/67)



Specifications

			mm	inch
Diameter		18.2+0/-0.7	0.72+0/-0.03	
	Heigh	t	67.0+0/-1.5	2.64+0/-0.06
	Approxin	nate	Grams	Ounces
	Weigh	t	60	2.12
	Nominal V	oltage	1.2	2V
Disc	harge	Average ²	3700	mAh
Cap	acity	Rated (Min.)	3500	mAh
	Approx. Internal impedance at 1000Hz at charged state.		201	mΩ
		Standard	370mA x 16hrs.	
CI	narge	Rapid ³	1750mA x 2.4 hrs.4	
	U	Low Rate	185mA x 32 hrs. 123mA x 48 hrs.	
		Standard	°C	°F
0	Charge		-10°C to 60°C	14°F to 140°F
r t		Rapid	-10°C to 45°C	14°F to 113°F
rat	Dis	charge	-10°C to 60°C	14°F to 140°F
Ambient mperatu		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F
	2.0.490	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 65°C	-4°F to 149°F

After charging at 0.1lt for 16 hours, discharging at 0.2lt.

² For reference only.

³ Need specially designed control system

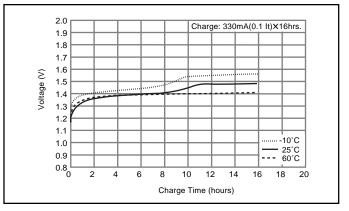
Control System: dT/dt cut-off; 1 to 2°C/min -∆V cut-off; -∆V per cell = 5 to 10 mV T-control; T=65°C Rapid charger timer; 2.4h (at 1.25a)

Trickle timer; within 2h

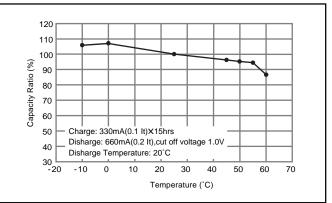
⁴ With control system

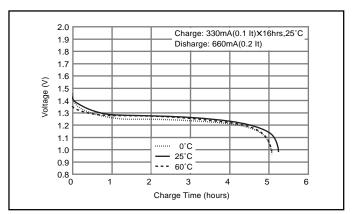
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

Typical Charge Characteristics



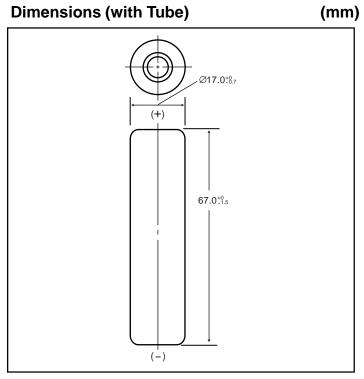
Typical Discharge Characteristics





- Note: [[t] was previously expressed as [C]. [lt] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

HHR380A Cylindrical L-A size (HR 17/67)



Specifications

	mm	inch
Diameter	17.0+0/-0.7	0.67+0/-0.03
Height	67.0+0/-1.5	2.64+0/-0.06
Approximate	Grams	Ounces
Weight	53	1.87

	Nominal V	oltage	1.2V	
Discharge		Average**	3800 mAh	
Cap	acity*	Rated (Min.)	3700	mAh
Approx. Internal impedance at 1000Hz at charged state.			25mΩ	
Charge Standard		370mA (0.1lt) x 16hrs.		
	Rapid***		2000mA dT/dt	
		Standard	°C	°F
စ	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
t in		Rapid	0°C to 40°C	32°F to 104°F
Ambient Temperature	Dis	charge	-10°C to 65°C	14°F to 149°F
Am _		< 1 year	-20°C to 35°C	-4°F to 95°F
L a	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

** For reference only.

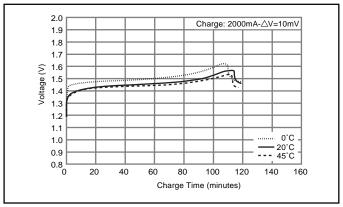
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*** For rapid charge: use dT/dt charge termination method. Refer to the Nickel Metal Hydride "Charge Methods" section for further details. Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

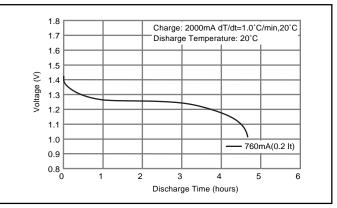
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

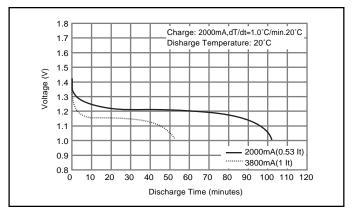
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours.
- n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics

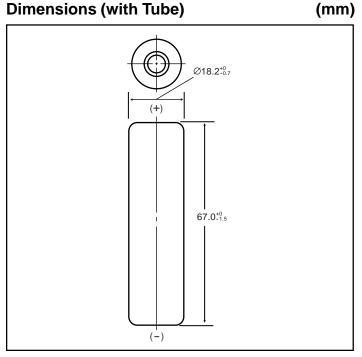




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HHR450A Cylindrical L-fat A size (HR 18/67)



Specifications

•					
			mm	inch	
Diameter		18.2+0/-0.7	0.72+0/-0.03		
	Heigh	t	67.0+0/-1.5	2.64+0/-0.06	
	Approxin	nate	Grams	Ounces	
	Weigh	t	60	2.12	
	Nominal V	oltage	1.	2V	
Disc	charge	Average**	4500) mAh	
Cap	acity*	Rated (Min.)	4200) mAh	
	Approx. Internal impedance at 1000Hz at charged state.		25	25mΩ	
CI	harge	Standard	420mA (0.	420mA (0.1lt) x 16hrs.	
		Rapid***	2000m	A dT/dt	
		Standard	°C	°F	
e	Charge	Stanuaru	0°C to 45°C	32°F to 113°F	
itur		Rapid	0°C to 40°C	32°F to 104°F	
Ambient Ambient D D D D D D D D D D D D D D D D D D D		charge	-10°C to 65°C	14°F to 149°F	
Am		< 1 year	-20°C to 35°C	-4°F to 95°F	
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F	
		< 1 month	-20°C to 55°C	-4°F to 131°F	

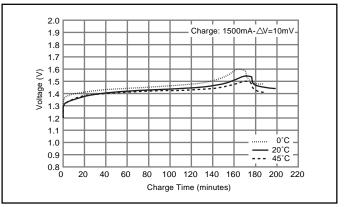
* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

*** For rapid charge: use dT/dt charge termination method. Refer to the Nickel Metal Hydride "Charge Methods" section for further details. Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

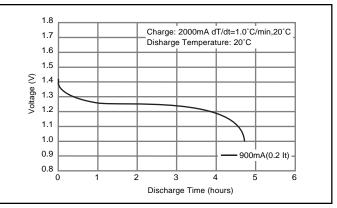
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

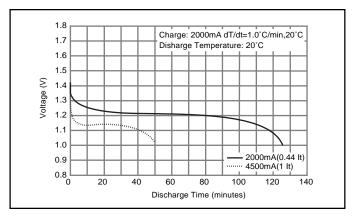
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours.
- n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics





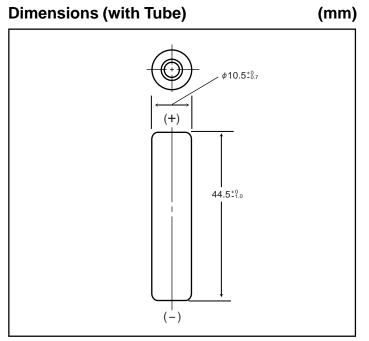
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^{**} For reference only.

HHR60AAAH Cylindrical AAA size (HR 11/45)



Specifications

	mm	inch
Diameter	10.5 +0/-0.7	0.41 +0/-0.03
Height	44.5 +0/-1.0	1.75 +0/-0.04
Approximate	Grams	Ounces
Weight	13	0.46

	Nominal Voltage		1.2V	
Disc	ischarge Average ² 550 mAh		mAh	
Сар	acity	Rated (Min.)	500	mAh
		impedance rged state.	35mΩ	
		Standard	50mA >	< 16hrs.
CI	narge	Rapid ³	250mA x	2.4 hrs.4
_	Low Rate		25mA x 32 hrs.	
		Low Rate	17mA x 48 hrs.	
	Charge	Standard	0°	°F
		Stanuaru	-10°C to 60°C	14°F to 140°F
ure	-	Rapid	-10°C to 45°C	14°F to 113°F
ien rat	Dis	charge	-10°C to 60°C	14°F to 140°F
Ambient mperatu		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	₹ ⊑ 9 Storage	< 6 months	-20°C to 45°C	-4°F to 113°F
F	otorage	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 65°C	-4°F to 149°F

After charging at 0.1lt for 16 hours, discharging at 0.2lt.

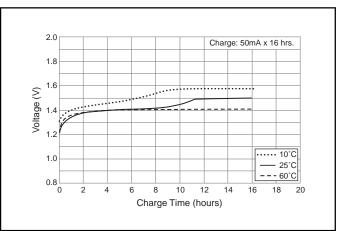
2 For reference only.

3 Need specially designed control system Control System: dT/dt cut-off; 1 to 2°C/min $-\triangle V$ cut-off; $-\triangle V$ per cell = 5 to 10 mV T-control; T=65°C Rapid charger timer; 2.4h (at 1.25a) Trickle timer; within 2h

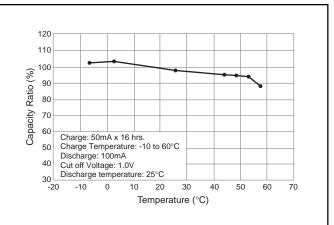
⁴ With control system

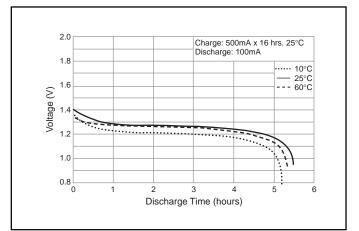
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design

Typical Charge Characteristics



Typical Discharge Characteristics



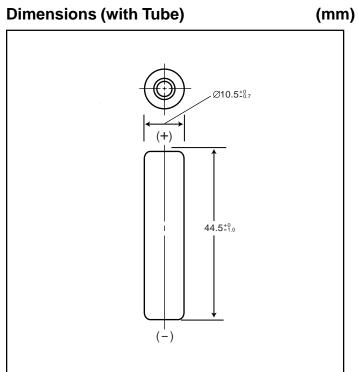


- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 - n = the time base [hours] for which the rated capacity is declared

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HHR70AAAJ Cylindrical HR AAA size (HR 11/45)



Specifications

	mm	inch
Diameter	10.5+0/-0.7	0.41+0/-0.03
Height	44.5+0/-1.0	1.75+0/-0.04
Approximate	Grams	Ounces
Weight	13	0.46

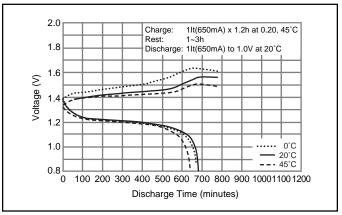
Nominal Voltage		1.2V		
Discharge Average**		720	mAh	
Сар	acity*	Rated (Min.)	700	mAh
	Approx. Internal impedance at 1000Hz at charged state.		30mΩ	
Charge		70mA (0.1lt) x 16hrs.		
	laige	Rapid	650mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
e	Charge	Standard	0°C to 45°C	32°F to 113°F
tur		Rapid	0°C to 40°C	32°F to 104°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 149°F
Am	du l	< 1 year	-20°C to 35°C	-4°F to 95°F
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt. ** For reference only.

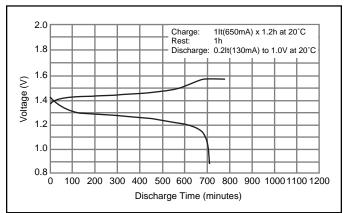
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

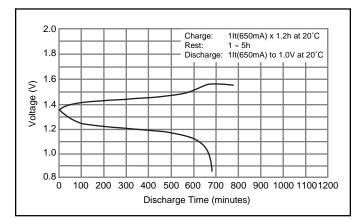
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 n = the time base [hours] for which the rated capacity is declared
 - n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



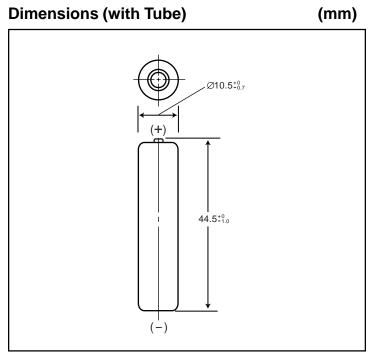
Typical Discharge Characteristics





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HHR75AAA/B Cylindrical AAA size (HR 11/45)



Specifications

	mm	inch
Diameter	10.5+0/-0.7	0.41+0/-0.03
Height	44.5+0/-1.0	1.75+0/-0.04
Approximate	Grams	Ounces
Weight	12	0.42

Nominal Voltage		1.2V		
Discharge Capacity*		Average**	730 mAh	
		Rated (Min.)	700 mAh	
Approx. Internal impedance at 1000Hz at charged state.		35mΩ		
CI	Charge Standard Rapid		70mA x 16hrs.	
			450mA x 1.7 hrs.	
		Standard	°C	°F
e	Charge	Standard	0°C to 45°C	32°F to 113°F
tur		Rapid	0°C to 40°C	32°F to 104°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 149°F
Am		< 1 year	-20°C to 35°C	-4°F to 95°F
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt. ** For reference only.

Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

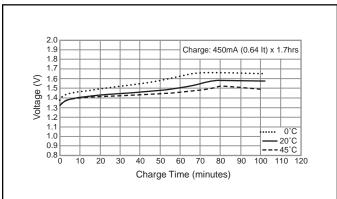
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

• [It] is the reference test current in ampres

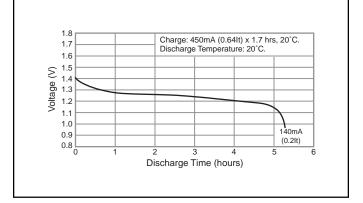
anasonic

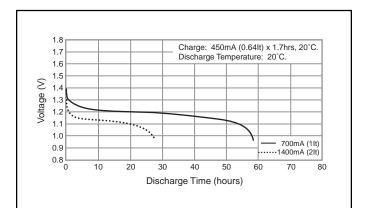
- [Cn] is the rated capacity of the cell or battery in Ampere-hours. ${\sf n}$ = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



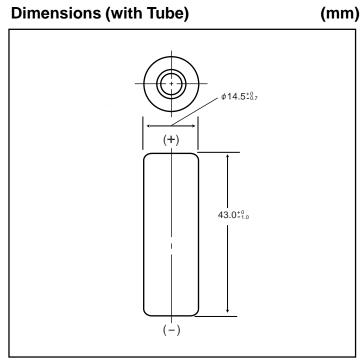
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR120AA Cylindrical 4/5AA size (HR 15/43)



Specifications

	mm	inch
Diameter	14.5+0/-0.7	0.57+0/-0.03
Height	43.0+0/-1.0	1.69+0/-0.04
Approximate	Grams	Ounces
Weight	23	0.81

Nominal Voltage		1.2V		
Discharge Capacity*		Average**	1220 mAh	
		Rated (Min.)	1150 mAh	
Approx. Internal impedance at 1000Hz at charged state.		19mΩ		
Charge Standard		120mA (0.1lt) x 16hrs.		
		Rapid	1200mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
ø	Charge	Standard	0°C to 45°C	32°F to 113°F
tur		Rapid	0°C to 40°C	32°F to 104°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 149°F
Am		< 1 year	-20°C to 35°C	-4°F to 95°F
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

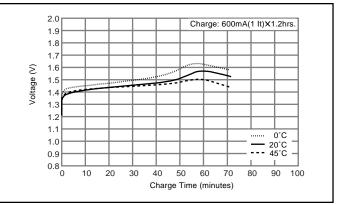
* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

** For reference only.

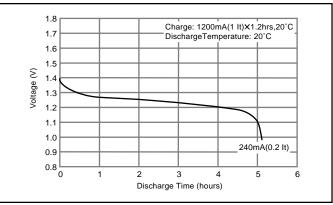
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

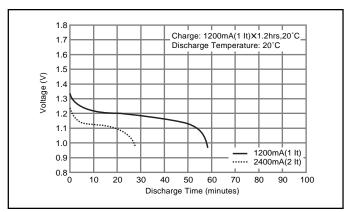
- [It] was previously expressed as [C]. [It] is an IEC standard expression Note: for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



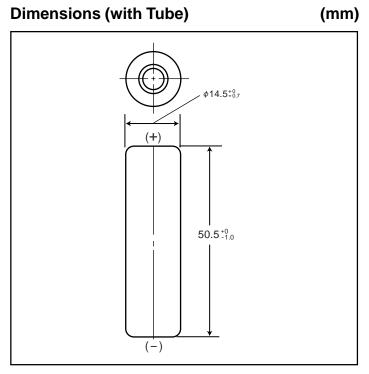
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR150AA Cylindrical AA size (HR 15/51)



Specifications

			mm	inch	
Diameter		14.5+0/-0.7	0.57+0/-0.03		
	Height	:	50.0+0/-1.0	1.97+0/-0.06	
	Approxim	ate	Grams	Ounces	
	Weight	t	26	0.92	
	Nominal V	oltage	1.:	2V	
Disc	harge	Average**	1580	mAh	
Сар	acity*	Rated (Min.) 1500	mAh	
	Approx. Internal impedance at 1000Hz at charged state.		20	20mΩ	
CI	narge	Standard	150mA (0.1	1lt) x 16hrs.	
		Rapid	1500mA (1	1500mA (1lt) x 1.2 hrs.	
		Standard	°C	°F	
စ	Charge	Stanuaru	0°C to 45°C	32°F to 113°F	
atur	tur	Rapid	0°C to 40°C	32°F to 104°F	
Ambient mperatu	Discharge		-10°C to 65°C	14°F to 149°F	
Ambient Temperature		< 1 year	-20°C to 35°C	-4°F to 95°F	
۳ ۲	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F	
		< 1 month	-20°C to 55°C	-4°F to 131°F	

* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

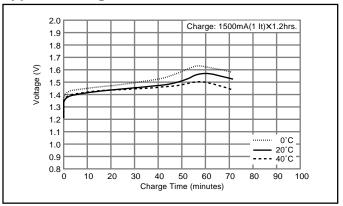
** For reference only.

nasonic

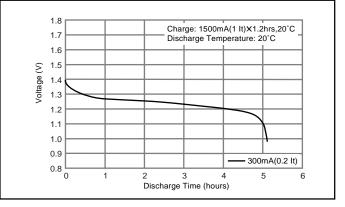
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

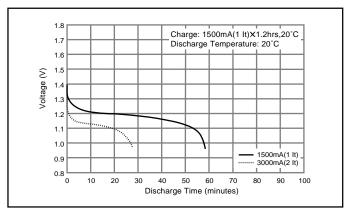
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



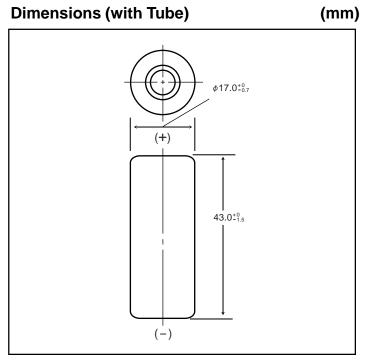
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR200A Cylindrical 4/5A size (HR 17/43)



Specifications

	mm	inch
Diameter	17.0+0/-0.7	0.67+0/-0.03
Height	43.0+0/-1.5	1.69+0/-0.06
Approximate	Grams	Ounces
Weight	32	1.13

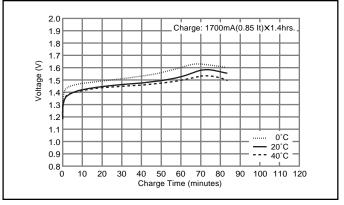
Nominal Voltage		1.2V		
Discharge Capacity*		Average**	2040 mAh	
		Rated (Min.)	2000 mAh	
Approx. Internal impedance at 1000Hz at charged state.		20mΩ		
Charge Standard		200mA (0.1lt) x 16hrs.		
		Rapid	2000mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
ø	Charge	Standard	0°C to 45°C	32°F to 113°F
tur		Rapid	0°C to 40°C	32°F to 104°F
bie era	Discharge		-10°C to 65°C	14°F to 149°F
Ambient Temperature	< 1 year	-20°C to 35°C	-4°F to 95°F	
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt. ** For reference only.

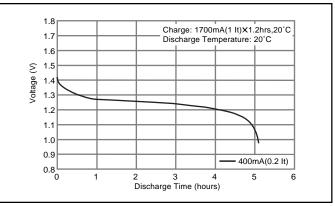
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

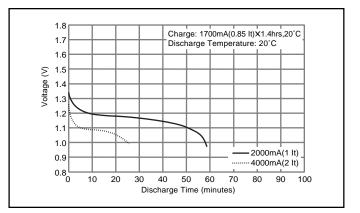
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics

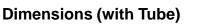


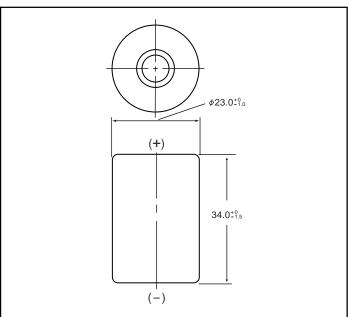


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(mm)

HHR200SCP Cylindrical 4/5SC size (HR 23/34)





Specifications

	mm	inch
Diameter	23.0+0/-0.1	0.91+0/-0.04
Height	34.0+0/-1.5	1.34+0/-0.06
Approximate	Grams	Ounces
Weight	42	1.48

	Nominal V	oltage	1.2V	
Discharge Capacity*		Average**	2100 mAh	
		Rated (Min.)	1900 mAh	
Approx. Internal impedance at 1000Hz at charged state.		5mΩ		
CI	Charge Standard		200mA (0.1lt) x 16hrs.	
		Rapid	2000mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
ure	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
rat		Rapid	0°C to 40°C	32°F to 104°F
dm be	Dis	charge	-10°C to 65°C	14°F to 149°F
A	E Charge Charge United	< 2 years	-20°C to 35°C	-4°F to 95°F
		< 6 months	-20°C to 45°C	-4°F to 113°F

After charging at 0.1lt for 16 hours, discharging at 0.2lt.

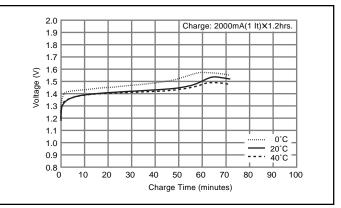
** For reference only.

Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

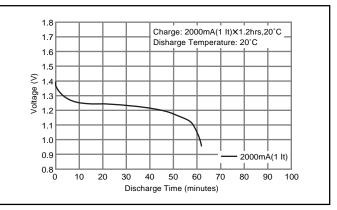
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

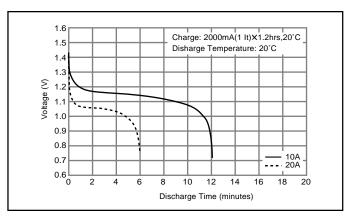
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



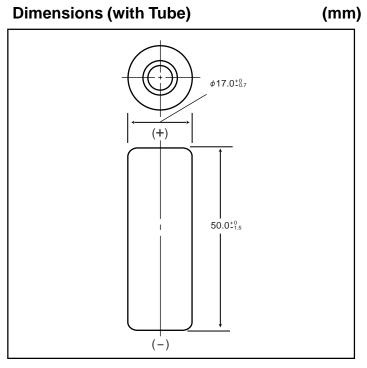
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR210A Cylindrical A size (HR 17/50)



Specifications

			mm	inch	
Diameter		17.0+0/-0.7	0.67+0/-0.03		
	Heigh	t	50.0+0/-1.5	1.97+0/-0.06	
	Approxin	nate	Grams	Ounces	
	Weigh	t	38	1.34	
	Nominal V	oltage	1.	2V	
Disc	Discharge Average**		2200	mAh	
Сар	acity*	Rated (Min.)	2100	mAh	
	Approx. Internal impedance at 1000Hz at charged state.		20	20mΩ	
CI	narge	Standard	210mA (0.	1lt) x 16hrs.	
	laige	Rapid	2100mA (1	lt) x 1.2 hrs.	
		Other dend	°C	°F	
e	Charge	Standard	0°C to 45°C	32°F to 113°F	
atur		Rapid	0°C to 40°C	32°F to 104°F	
Ambient mperatu	era Dis	charge	-10°C to 65°C	14°F to 149°F	
Ambient Temperature		< 1 year	-20°C to 35°C	-4°F to 95°F	
L D	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F	
		< 1 month	-20°C to 55°C	-4°F to 131°F	

* After charging at 0.1lt for 16 hours, discharging at 0.2lt. ** For reference only.

Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

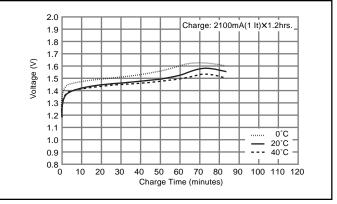
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

• [It] is the reference test current in ampres

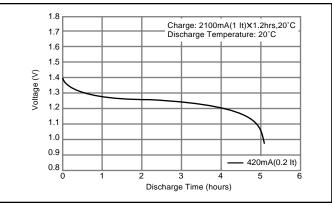
nasonic

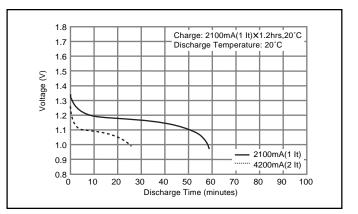
• [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics

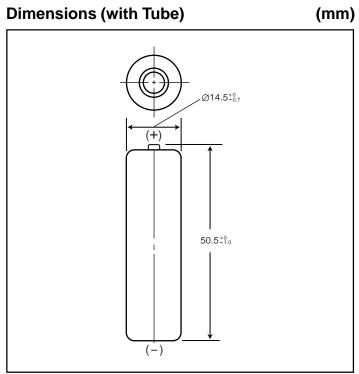




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HHR210AA/B Cylindrical AA size (HR 15/51)



Specifications

	mm	inch
Diameter	14.5 +0/-0.7	0.57 +0/-0.3
Height	50.5 +0/-1.0	1.99 +0/-0.5
Approximate	Grams	Ounces
Weight	29	1.02

	Nominal Vo	ltage	1.2V	
Discharge Capacity*		Average**	2080mAh	
		Rated (Min.)	2000	mAh
Approx. internal Impedance at 1000Hz at charged state.		25mΩ		
C	Charge Standard		200mA (0.1lt) x 16 hrs.	
	Charge Rapid		1200mA (11t) x 2 hrs.	
		Standard	°C	°F
e.	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
ent atur		Rapid	0°C to 40°C	32°F to 113°F
nbie	Discharge		-10°C to 65°C	14°F to 149°F
Ar	Enarge Charge Disch Storage	< 1 year	-20°C to 35°C	-4°F to 95°F
		< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

** For reference only.

anasonic

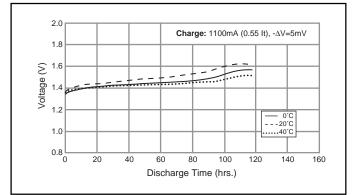
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

[It] was previously expressed as [C]. [It] is an IEC standard expression Note: for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h

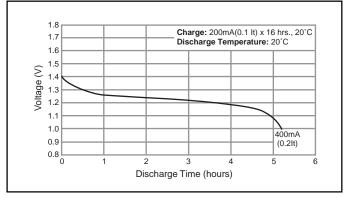
[It] is the reference test current in ampres

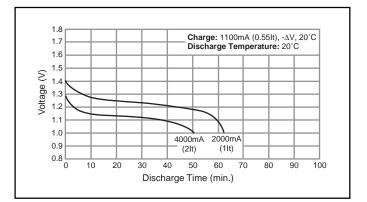
* [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



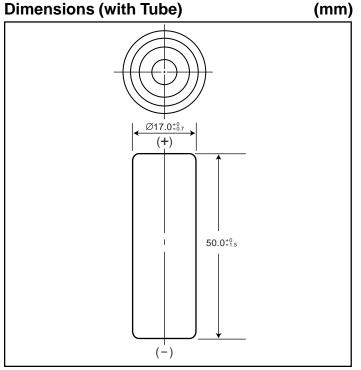
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR210AH Cylindrical A size (HR 17/50)



Specifications

			mm	inch	
Diameter		17.0+0/-0.7	0.67+0/-0.03		
	Height		50.0+0/-1.5	1.97+0/-0.06	
	Approximat	te	Grams	Ounces	
	Weight		38	1.34	
	Nominal Vo	tage	1.	2V	
Dis	scharge	Average ²	2050)mAh	
	pacity	Rated (Min.) 1900)mAh	
	Approx. internal Impedance at 1000Hz at charged state.		20mΩ		
C	harge	Standard	210mA (0.1	210mA (0.1lt) x 16 hrs.	
	liaige	Rapid		-	
		Standard	°C	۴F	
	Charge	Standard	-10°C to 60°C	14°F to 140°F	
nt ure		Rapid	-	-	
bier erat	Discl	harge	-10°C to 60°C	14°F to 140°F	
Am	Discl	< 1 year	-20°C to 35°C	-4°F to 95°F	
Le l		< 3 months	-20°C to 45°C	-4°F to 113°F	
	otorage	< 1 month	-20°C to 55°C	-4°F to 131°F	
		< 1 week	-20°C to 60°C	-4°F to 140°F	

¹ After charging at 0.1lt for 16 hours, discharging at 0.2lt.

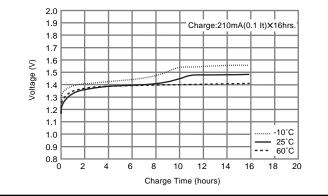
² For reference only.

Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

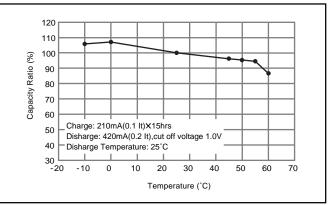
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

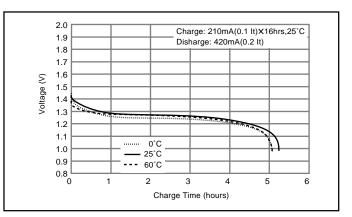
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours.
- n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics



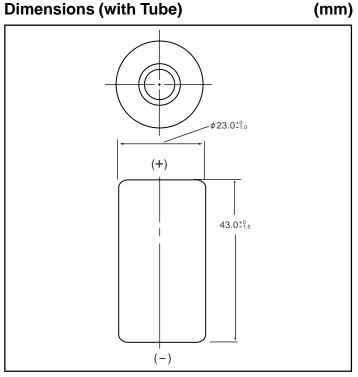


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NICKEL METAL HYDRIDE HANDBOOK

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HHR250SCH Cylindrical SC size (HR 23/43)



Specifications

	mm	inch
Diameter	23.0+0/-1.0	0.91+0/-0.04
Height	43.0+0/-1.5	1.69+0/-0.06
Approximate	Grams	Ounces
Weight	55	1.94

Nominal Voltage		1.2V		
Discharge Average ²		2650	mAh	
Cap	acity	Rated (Min.)	2500	mAh
Approx. Internal imp at 1000Hz at charge			5mΩ	
Standard		250mA	x 16hrs.	
CI	Charge R		1250mA x 2.4 hrs.4	
en ge		Low Rate	125mA x 32 hrs.	
		LOW Kale	83mA x 48 hrs.	
		Standard	O°	°F
	Charge	Stanuaru	-10°C to 60°C	14°F to 140°F
ure		Rapid	-10°C to 45°C	14°F to 113°F
ien rat	Dis	charge	-10°C to 60°C	14°F to 140°F
Ambient mperatu		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F
Ē	Storage	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 65°C	-4°F to 149°F

 $\frac{1}{2}$ After charging at 0.1lt for 16 hours, discharging at 0.2lt.

² For reference only.

³ Need specially designed control system

Control System:

dT/dt cut-off; 1 to 2°C/min

 $-\triangle V$ cut-off; $-\triangle V$ per cell = 5 to 10 mV T-control; T=65°C

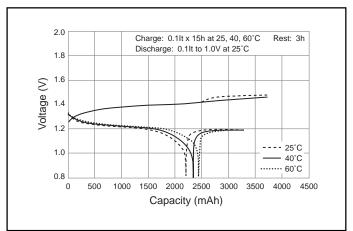
Rapid charger timer; 2.4h (at 1.25a)

Trickle timer; within 2h

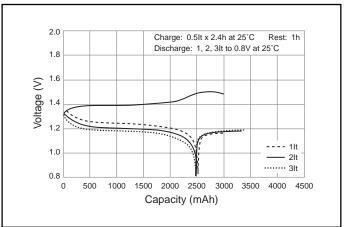
⁴ With control system

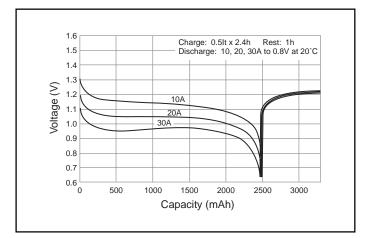
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

Typical Charge Characteristics



Typical Discharge Characteristics





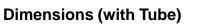
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h
 - * [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 - n = the time base [hours] for which the rated capacity is declared

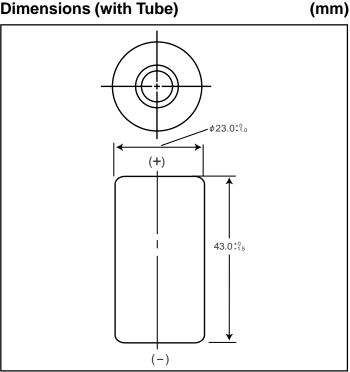
Panasonic

NICKEL METAL HYDRIDE HANDBOOK

AUGUST 2005

HHR260SCP Cylindrical SC size (HR 23/43)





Specifications

	mm	inch
Diameter	23.0+0/-1.0	0.91+0/-0.04
Height	43.0+0/-1.5	1.69+0/-0.06
Approximate	Grams	Ounces
Weight	55	1.94

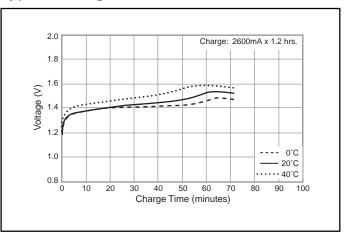
Nominal Voltage		1.2V		
Discharge A		Average ²	2600 mAh	
Cap	acity	Rated (Min.)	2450 mAh	
Approx. Internal impedance at 1000Hz at charged state.		5mΩ		
	Standard		260mA x 16hrs.	
	Charge Rapid		2600mA x 1.2 hrs.	
		Cton dond	°C	۴F
e	Charge	Standard	0°C to 45°C	32°F to 113°F
atu	J	Rapid	10°C to 40°C	50°F to 104°F
bie	Discharge		-10°C to 65°C	14°F to 149°F
u A m		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

¹ After charging at 0.1lt for 16 hours, discharging at 0.2lt. ² For reference only.

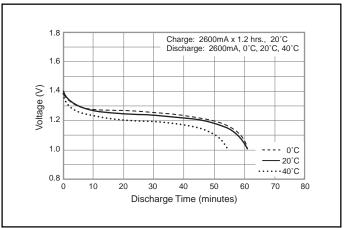
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

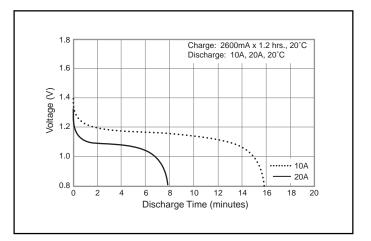
- [It] was previously expressed as [C]. [It] is an IEC standard expression Note: for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h
 - [It] is the reference test current in ampres
 - * [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 - n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics





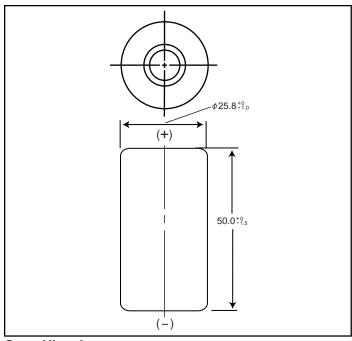
NICKEL METAL HYDRIDE HANDBOOK

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(mm)

HHR300CH Cylindrical C size (HR 26/50) for backup use





Specifications

	mm	inch
Diameter	25.8+0/-1.0	1.02+0/-0.04
Height	50.0+0/-1.5	1.97+0/-0.06
Approximate	Grams	Ounces
Weight	80	2.82

Nominal Voltage		1.2V		
Discharge Capacity ¹		Average ²	3300 mAh	
		Rated (Min.)	3100	mAh
	Approx. Internal impedance at 1000Hz at charged state.		5mΩ	
Standard		300mA (0.1	1 lt) x 16hrs.	
CI	harge	Rapid ³	1500mA (1lt) x 2.4 hrs.4	
	Lov		155mA x 32 hrs. 100mA x 48 hrs.	
		Standard	۵°	°F
	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
t ure	Charge	Rapid	10°C to 40°C	32°F to 104°F
ien rati		Low Rate	-10°C to 45°C	14°F to 149°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 113°F
A Ten		< 1 year	-20°C to 35°C	-4°F to 95°F
	Storage	< 3 months	-20°C to 35°C	-4°F to 95°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

¹ After charging at 0.1lt for 16 hours, discharging at 0.2lt.

² For reference only.

³ Need specially designed control system

Control System:

dT/dt cut-off; 1 to 2°C/min $-\triangle V$ cut-off; $-\triangle V$ per cell = 5 to 10 mV T-control; T=65°C

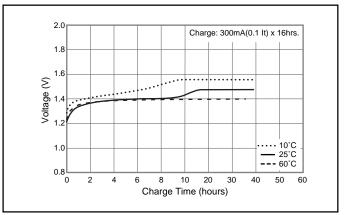
Rapid charger timer; 2.4h (at 1.25a)

Trickle timer; within 2h

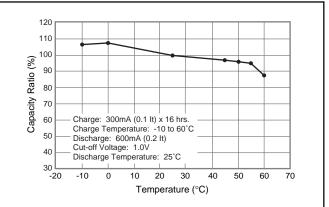
⁴ With control system

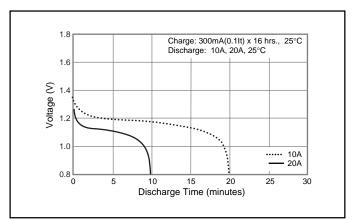
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

Typical Charge Characteristics



Typical Discharge Characteristics





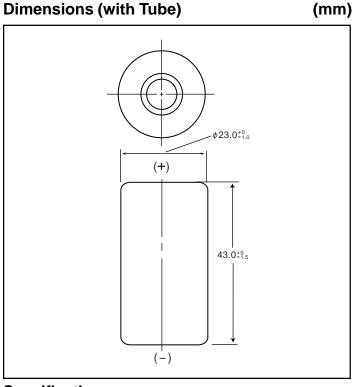
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 - n = the time base [hours] for which the rated capacity is declared

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HHR300SCP Cylindrical SC size (HR 23/43)



Specifications

	mm	inch
Diameter	23.0+0/-0.1	0.91+0/-0.04
Height	43.0+0/-1.5	1.69+0/-0.06
Approximate	Grams	Ounces
Weight	57	2.01

	Nominal V	oltage	1.2V	
Discharge Capacity*		Average**	3050 mAh	
		Rated (Min.)	2800 mAh	
	Approx. Internal impedance at 1000Hz at charged state.		4n	nΩ
CI	Charge Stand		300mA (0.1lt) x 16hrs.	
	3 -	Rapid	3000mA (1lt) x 1.2 hrs.	
		Standard	°C	°F
ure	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
ien		Rapid	0°C to 40°C	32°F to 104°F
dm	ନ୍ଦୁ a Discharge		-10°C to 65°C	14°F to 149°F
Ambient Temperature	Le A	< 2 years	-20°C to 35°C	-4°F to 95°F
	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

** For reference only.

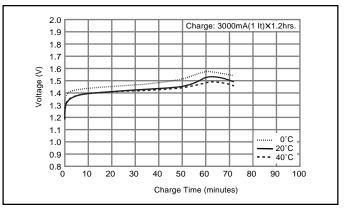
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Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

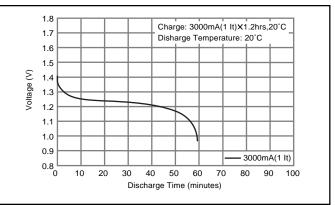
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

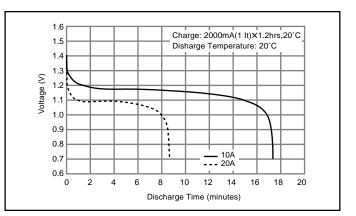
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



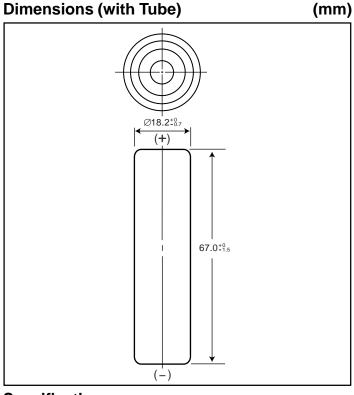
Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK

HHR330APH Cylindrical L-Fat A size (HR 18/67)



Specifications

			mm	inch
Diameter		18.2+0/-0.7	0.72+0/-0.03	
	Heigh	t	67.0+0/-1.5	2.64+0/-0.06
	Approxin	nate	Grams	Ounces
	Weigh	t	60	2.12
	Nominal V	oltage	1.2	2V
Disc	harge	Average ²	3300	mAh
Cap	acity	Rated (Min.)	3200	mAh
		impedance	5.5	mΩ
at 100	00Hz at cha	rged state.		
		Standard	330mA x 16hrs.	
CI	narge	Rapid ³	1650mA x 2.4 hrs.4	
	•	Low Rate		x 32 hrs.
		Lon Hato	110mA x 48 hrs.	
		Standard	O°	°F
0	Charge		-10°C to 60°C	14°F to 140°F
n. t		Rapid	-10°C to 45°C	14°F to 113°F
Discharge		-10°C to 60°C	14°F to 140°F	
Ambient mperatu		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F
F F	Storage	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 65°C	-4°F to 149°F

After charging at 0.1lt for 16 hours, discharging at 0.2lt.

² For reference only.

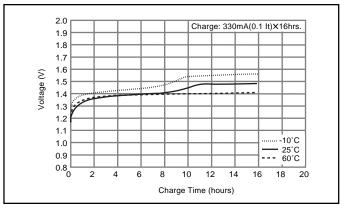
³ Need specially designed control system

Control System: dT/dt cut-off; 1 to 2°C/min $-\Delta V$ cut-off; $-\Delta V$ per cell = 5 to 10 mV T-control; T=65°C Rapid charger timer; 2.4h (at 1.25a) Trickle timer; within 2h

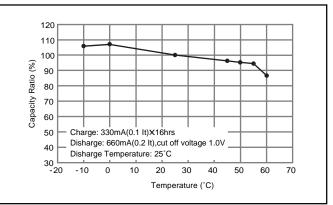
⁴ With control system

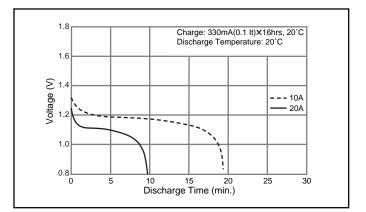
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

Typical Charge Characteristics



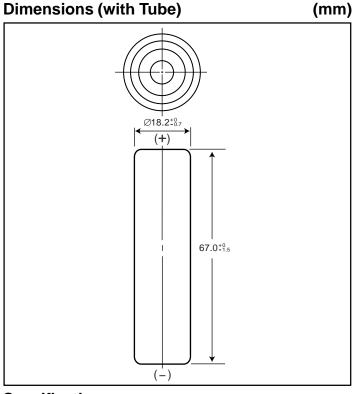
Typical Discharge Characteristics





- Note: [[It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

HHR370AH Cylindrical L-Fat A size (HR 18/67)



Specifications

			mm	inch
Diameter		18.2+0/-0.7	0.72+0/-0.03	
	Heigh	t	67.0+0/-1.5	2.64+0/-0.06
	Approxin	nate	Grams	Ounces
	Weigh	t	60	2.12
	Nominal V	oltage	1.2	2V
Disc	harge	Average ²	3700	mAh
Cap	acity	Rated (Min.)	3500	mAh
		impedance rged state.	201	mΩ
		Standard	370mA x 16hrs.	
CI	narge	Rapid ³	1750mA x 2.4 hrs.4	
	U	Low Rate		x 32 hrs. x 48 hrs.
		Standard	°C	°F
0	Charge		-10°C to 60°C	14°F to 140°F
r t		Rapid	-10°C to 45°C	14°F to 113°F
rat	Discharge que de construction of the second		-10°C to 60°C	14°F to 140°F
d m be		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F
	2.0.490	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 65°C	-4°F to 149°F

After charging at 0.1lt for 16 hours, discharging at 0.2lt.

² For reference only.

³ Need specially designed control system

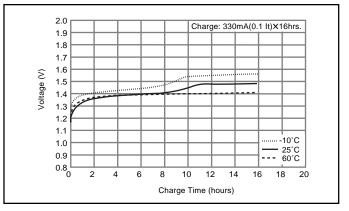
Control System: dT/dt cut-off; 1 to 2°C/min -∆V cut-off; -∆V per cell = 5 to 10 mV T-control; T=65°C Rapid charger timer; 2.4h (at 1.25a)

Trickle timer; within 2h

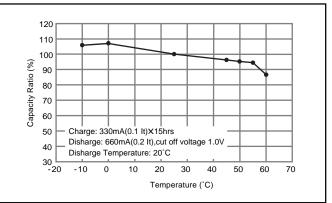
⁴ With control system

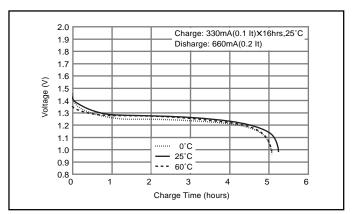
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

Typical Charge Characteristics



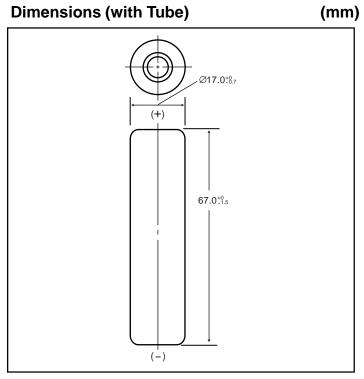
Typical Discharge Characteristics





- Note: [[t] was previously expressed as [C]. [lt] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours. n = the time base [hours] for which the rated capacity is declared

HHR380A Cylindrical L-A size (HR 17/67)



Specifications

	mm	inch
Diameter	17.0+0/-0.7	0.67+0/-0.03
Height	67.0+0/-1.5	2.64+0/-0.06
Approximate	Grams	Ounces
Weight	53	1.87

	Nominal V	oltage	1.2V	
Discharge		Average**	3800 mAh	
Cap	acity*	Rated (Min.)	3700	mAh
		impedance rged state.	25mΩ	
CI	Charge Standard		370mA (0.1	1lt) x 16hrs.
	laige	Rapid***	2000mA dT/dt	
		Standard	°C	°F
စ	Charge	Stanuaru	0°C to 45°C	32°F to 113°F
t in		Rapid	0°C to 40°C	32°F to 104°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 149°F
Am		< 1 year	-20°C to 35°C	-4°F to 95°F
L P	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

** For reference only.

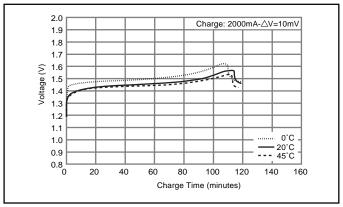
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*** For rapid charge: use dT/dt charge termination method. Refer to the Nickel Metal Hydride "Charge Methods" section for further details. Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

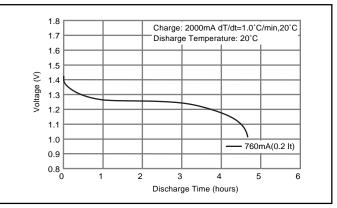
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

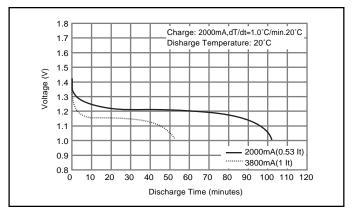
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours.
- n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics

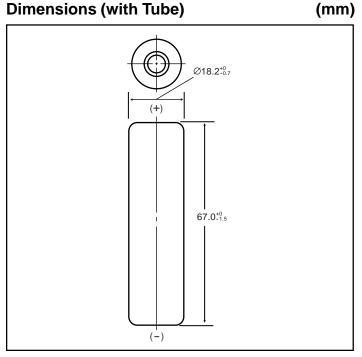




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HHR450A Cylindrical L-fat A size (HR 18/67)



Specifications

•					
			mm	inch	
Diameter		18.2+0/-0.7	0.72+0/-0.03		
	Heigh	t	67.0+0/-1.5	2.64+0/-0.06	
	Approxin	nate	Grams	Ounces	
	Weigh	t	60	2.12	
	Nominal V	oltage	1.	2V	
Disc	charge	Average**	4500) mAh	
Cap	acity*	Rated (Min.)	4200	4200 mAh	
	Approx. Internal impedance at 1000Hz at charged state.		25	mΩ	
CI	harge	Standard	420mA (0.	420mA (0.1lt) x 16hrs.	
		Rapid***	2000m	A dT/dt	
		Standard	°C	°F	
e	Charge	Stanuaru	0°C to 45°C	32°F to 113°F	
itur		Rapid	0°C to 40°C	32°F to 104°F	
Ambient Temperature	Dis	charge	-10°C to 65°C	14°F to 149°F	
am amp		< 1 year	-20°C to 35°C	-4°F to 95°F	
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F	
		< 1 month	-20°C to 55°C	-4°F to 131°F	

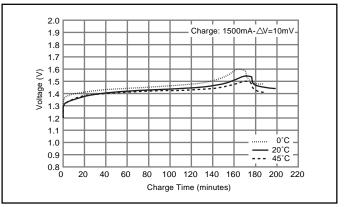
* After charging at 0.1lt for 16 hours, discharging at 0.2lt.

*** For rapid charge: use dT/dt charge termination method. Refer to the Nickel Metal Hydride "Charge Methods" section for further details. Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

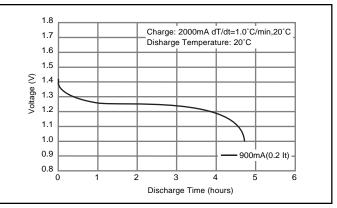
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

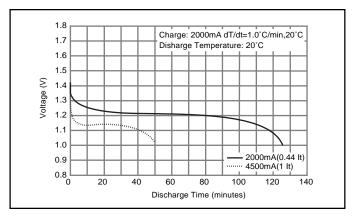
- [It] is the reference test current in ampres
- [Cn] is the rated capacity of the cell or battery in Ampere-hours.
- n = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics





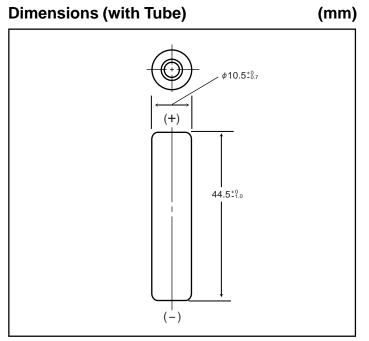
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^{**} For reference only.

HHR60AAAH Cylindrical AAA size (HR 11/45)



Specifications

	mm	inch
Diameter	10.5 +0/-0.7	0.41 +0/-0.03
Height	44.5 +0/-1.0	1.75 +0/-0.04
Approximate	Grams	Ounces
Weight	13	0.46

	Nominal Voltage		1.2V	
Discharge Average ²		550	mAh	
Сар	acity	Rated (Min.)	500	mAh
		impedance rged state.	35mΩ	
Charge Standard Charge Rapid ³		50mA >	< 16hrs.	
		Rapid ³	250mA x	2.4 hrs.4
		Low Rate	25mA x 32 hrs.	
		Low Rate	17mA x 48 hrs.	
		Standard	0°	°F
	Charge	Stanuaru	-10°C to 60°C	14°F to 140°F
ure	-	Rapid	-10°C to 45°C	14°F to 113°F
ien rat	Dis	charge	-10°C to 60°C	14°F to 140°F
Ambient mperatu		< 1 year	-20°C to 35°C	-4°F to 95°F
Ambient Temperature	Storage	< 6 months	-20°C to 45°C	-4°F to 113°F
Ē	otorage	< 1 month	-20°C to 55°C	-4°F to 131°F
		< 1 week	-20°C to 65°C	-4°F to 149°F

After charging at 0.1lt for 16 hours, discharging at 0.2lt.

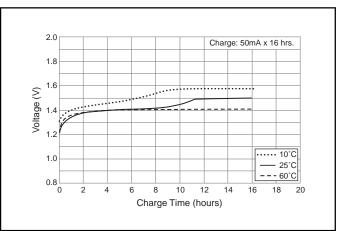
2 For reference only.

3 Need specially designed control system Control System: dT/dt cut-off; 1 to 2°C/min $-\triangle V$ cut-off; $-\triangle V$ per cell = 5 to 10 mV T-control; T=65°C Rapid charger timer; 2.4h (at 1.25a) Trickle timer; within 2h

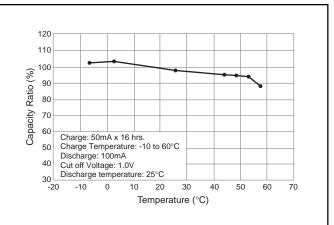
⁴ With control system

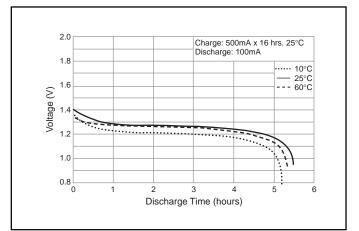
Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design

Typical Charge Characteristics



Typical Discharge Characteristics



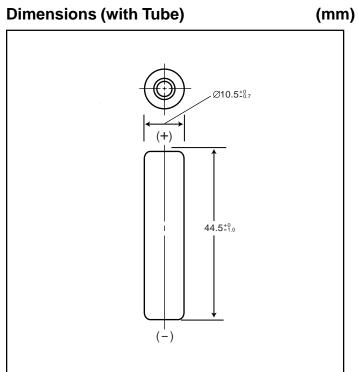


- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 - n = the time base [hours] for which the rated capacity is declared

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HHR70AAAJ Cylindrical HR AAA size (HR 11/45)



Specifications

	mm	inch
Diameter	10.5+0/-0.7	0.41+0/-0.03
Height	44.5+0/-1.0	1.75+0/-0.04
Approximate	Grams	Ounces
Weight	13	0.46

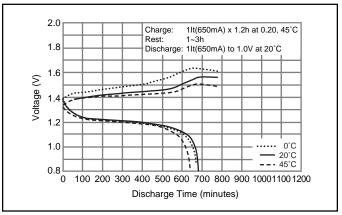
Nominal Voltage		1.2V		
Discharge Avera		Average**	720	mAh
Сар	acity*	Rated (Min.)	700	mAh
	Approx. Internal impedance at 1000Hz at charged state.		30mΩ	
CI	Charge		70mA (0.1lt) x 16hrs.	
	laige	Rapid	650mA (1lt) x 1.2 hrs.	
		Ctowdowd	°C	°F
e	Charge	Standard	0°C to 45°C	32°F to 113°F
tur		Rapid	0°C to 40°C	32°F to 104°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 149°F
Am	a m m m m m m m m m m m m m m m m m m m	< 1 year	-20°C to 35°C	-4°F to 95°F
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt. ** For reference only.

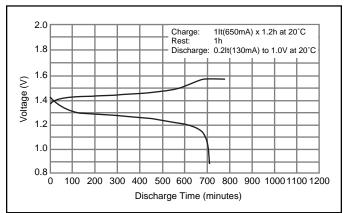
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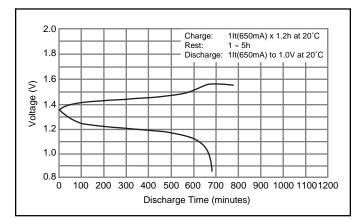
- Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.
 - [It] is the reference test current in ampres
 - [Cn] is the rated capacity of the cell or battery in Ampere-hours.
 n = the time base [hours] for which the rated capacity is declared
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Typical Charge Characteristics



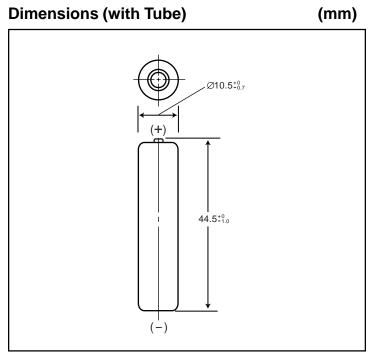
Typical Discharge Characteristics





ASONIC NICKEL METAL HYDRIDE HANDBOOK

HHR75AAA/B Cylindrical AAA size (HR 11/45)



Specifications

	mm	inch
Diameter	10.5+0/-0.7	0.41+0/-0.03
Height	44.5+0/-1.0	1.75+0/-0.04
Approximate	Grams	Ounces
Weight	12	0.42

	Nominal V	oltage	1.2V	
Discharge Capacity*		Average**	730 mAh	
		Rated (Min.)	700 mAh	
Approx. Internal impedance at 1000Hz at charged state.		35mΩ		
CI	Charge Standard		70mA x 16hrs.	
		Rapid	450mA x 1.7 hrs.	
		Standard	°C	°F
e	Charge	Standard	0°C to 45°C	32°F to 113°F
tur		Rapid	0°C to 40°C	32°F to 104°F
Ambient Temperature	Discharge		-10°C to 65°C	14°F to 149°F
Am		< 1 year	-20°C to 35°C	-4°F to 95°F
Te	Storage	< 3 months	-20°C to 45°C	-4°F to 113°F
		< 1 month	-20°C to 55°C	-4°F to 131°F

* After charging at 0.1lt for 16 hours, discharging at 0.2lt. ** For reference only.

Battery performance and cycle life are strongly affected by how they are used. In order to maximize battery safety, please consult Panasonic when determining charge / discharge specs, warning label contents and unit design.

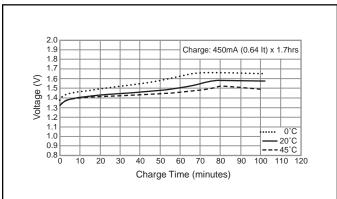
Note: [It] was previously expressed as [C]. [It] is an IEC standard expression for the amount of charge or discharge current and is expressed as: It(A) = Cn (Ah)/1h.

• [It] is the reference test current in ampres

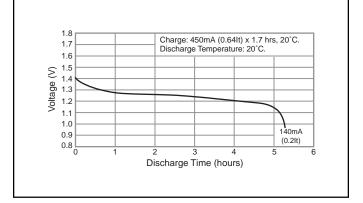
anasonic

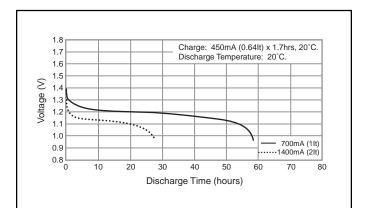
- [Cn] is the rated capacity of the cell or battery in Ampere-hours. ${\sf n}$ = the time base [hours] for which the rated capacity is declared

Typical Charge Characteristics



Typical Discharge Characteristics





NICKEL METAL HYDRIDE HANDBOOK



Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию.

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С нами вы становитесь еще успешнее!

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