

# Panasonic ideas for life

**Short Form Catalog 2006/2007**

International English



## **Batteries for OEM Customers**

*Ni-MH, Li-Ion, Ni-Cd, Lithium, VRLA, Zinc Carbon, Alkaline, Memory Cards, Battery Packs*



PIE Branch  
Hamburg

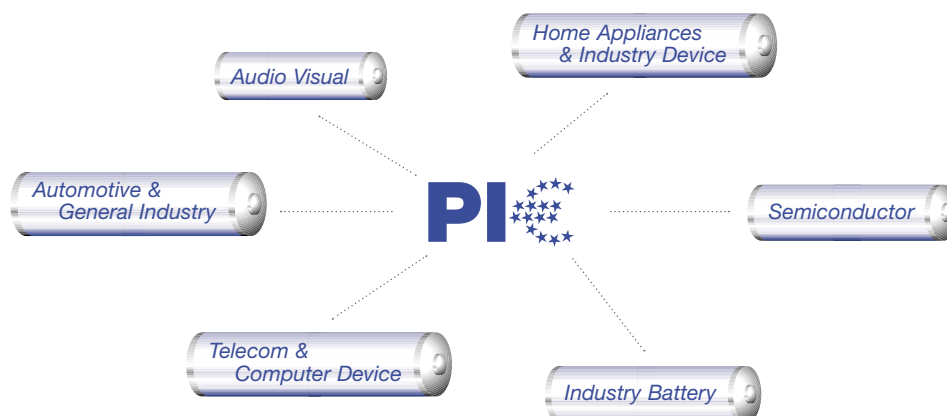
## Panasonic Industrial Europe

*Find out how we can power your business!*

Matsushita Electric Industrial Co. Ltd., founded in Osaka 1918, is one of the world's largest manufacturers of quality electronic and electrical equipment. Its subsidiary, Panasonic Industrial Europe GmbH (PIE) deals with a wide diversified range of industrial products for all European coun-

tries. This company was formed in 1998 to strengthen Panasonic's pan-European industry operation, and today is active in such different business fields as Car Electronics, Components, Consumer Batteries, OEM/Industrial Batteries etc. to satisfy its customer's needs.

### PIE Organisation



The Industry Battery Unit (IBU) is responsible for the OEM/Industrial Battery business in Europe, with sales offices strategically located throughout the continent. The head office, located in Germany (Hamburg), is responsible for Central Europe (Germany, Benelux, Swiss, Austria, Scandinavia) and Eastern Europe. The UK/Ireland (Bracknell), France (Paris), Italy (Milano) and Spain (Barcelona) are supported by local offices. In addition, we are able to offer an extensive distributor network. Based on both of these sales channels we are capable of supplying each customer's own power solution. Find out how we can power your business!

We are able to offer you a wide range of individual power solutions for portable and stationary applications. Our product range includes high reliability batteries such as Lithium-Ion, Lithium, Nickel-Metal Hydrid, Nickel-Cadmium, Valve Regulated Lead Acid, Alkaline and Zinc Carbon. Based on this battery range we can power your business in virtually all applications.

*Such as:*

- *Mobile Phones → Powertools*
- *UPS → Measuring Devices*
- *Keyless Entry → Personal Care*
- *Vacuum Cleaner → Price Tags*
- *Medical Equipment*
- *Electronic toll collect system*
- *Portable communication devices*
- *Communication infrastructure*
- *RFID Tags → Wind Turbines*
- *Memory backup applications*

## Quality Commitment

*Panasonic Batteries – safety, long-life and power!*

Matsushita Batteries Industrial (MBI) started its production of Panasonic batteries in 1931. Today MBI is one of the most diversified global battery manufacturers with a network of 23 manufacturing companies in 15 countries. More than 16,000 employees are dedicated to the invention and development of new batteries for a new world.



When it comes to production our facilities employ leading edge manufacturing processes meeting the best quality standards. Our factories are certified to ISO standards. This means that each factory has its own quality and environmental management. The ISO 9000 and ISO 14000 series are the minimum benchmarks that ensure our excellent product reliability. In addition our VRLA batteries are for example approved to German VdS standard and U.S. UL standard.



# Nickel Metal Hydride

Rechargeable  
1.2V



## Cylindrical

Diameter	Size	IEC	Model Number	Nominal Voltage (V)	Discharge Capacity <sup>*1</sup> (mAh)		Dimensions with Tube (mm)		Approx. Weight (g)
					Average <sup>*2</sup>	Rated (Min.)	Diameter	Height	
AAA	AAA	HR11/45	HHR-70AAA/FT	1.2	730	700	10.5 +0/-0.7	44.5 + 0/-1.0	12
			HHR-75AAA/HT <sup>*3</sup>						
			HHR-80AAA/HT <sup>*3</sup>		780	750			13
AA	2/3AA	—	HHR-35AA/FT		390	350	14.5 + 0/-0.7	28.5 + 0/-1.0	10.5
	4/5AA	HR15/43	HHR-120AA/FT		1,220	1,150		43.0 + 0/-1.0	23
	AA	HR15/51	HHR-70AA/FT		780	700		48.8 + 0/-1.5	21
			HHR-70AA/HT <sup>*4</sup>					50.5 + 0/-1.5	
			HHR-110AA/FT		1,180	1,100		50.0 + 0/-1.0	26
			HHR-150AA/FT		1,580	1,500			
			HHR-210AA/HT <sup>*4</sup>		2,080	2,000			
			HHR-260AA/HT <sup>*4</sup>		2,500	2,400		50.5 + 0/-1.0	29
A	4/5A	HR17/43	HHR-200A/FT		2,040	2,000	17.0 + 0/-0.7	43.0 + 0/-1.5	32
	A	HR17/50	HHR-210A/FT		2,200	2,100		50.0 + 0/-1.5	38
	L-A	HR17/67	HHR-380A/FT <sup>*5</sup>		3,800	3,700		67.0 + 0/-1.5	53
	LFat/A	—	HHR-450A/FT <sup>*5</sup>		4,500	4,200	18.2 + 0/-0.7	34.0 + 0/-1.5	60
SC	4/5SC	—	HHR-200SCP/FT <sup>*6</sup>		2,100	1,900	23.0 + 0/-1.0	34.0 + 0/-1.5	42
	SC	HR23/43	HHR-260SCP/FT <sup>*6</sup>		2,600	2,450		43.0 + 0/-1.5	55
			HHR-300SCP/FT <sup>*6</sup>		3,050	2,800			57
D	D	HR33/62	HHR-650D/FT <sup>*6</sup>		6,800	6,500	33.0 + 0/-1.0	60.8 + 0/-2.0	170
			HHR-900D/FT <sup>*6</sup>		9,000	8,250		61.0 + 0/-1.5	

<sup>\*1</sup> After charging at 0.1 CmA for 16 hours, discharging at 0.2 CmA.

<sup>\*4</sup> Compatible with consumer AA size.

<sup>\*2</sup> For reference only.

<sup>\*5</sup> Mainly for PC applications.

<sup>\*3</sup> Compatible with consumer AAA size.

<sup>\*6</sup> For high power use applications such as power tools.

## Cylindrical for back-up use

Diameter	Size	IEC	Model Number	Nominal Voltage (V)	Discharge Capacity <sup>*1</sup> (mAh)		Dimensions with Tube (mm)		Approx. Weight (g)
					Average <sup>*2</sup>	Rated (Min.)	Diameter	Height	
AAA	AAA	HR11/45	HHR-60AAAH/FT	1.2	550	500	10.5 +0/-0.7	44.5 + 0/-1.0	13
A	A	HR17/50	HHR-210AH/FT		2,050	1,900	17.0 +0/-0.7	50.0 + 0/-1.5	38
	LFat/A	—	HHR-370AH/FT		3,700	3,500	18.2 + 0/-0.7	67.0 + 0/-1.5	60
		—	HHR-330APH/FT		3,300	3,200			
SC	SC	HR23/43	HHR-250SCH/FT		2,650	2,500	23.0 + 0/-1.0	43.0 + 0/-1.5	55
C	C	HR26/50	HHR-300CH/FT		3,300	3,100	26.0 + 0/-1.0	50.0 + 0/-2.0	80
F	F	HR33/90	HHR-1100FH/FT		12,000	11,000	33.0 + 0/-1.0	91.0 + 0/-1.5	240
V	V	—	HHR-10000VH/FT <sup>*7</sup>		95,000	90,000	62.0 + 0/-1.0	175.0 + 0/-2.0	1,620

<sup>\*1</sup> After charging at 0.1 CmA for 16 hours, discharging at 0.2 CmA.

<sup>\*2</sup> For reference only.

<sup>\*7</sup> Customer specification is required.

## Prismatic / E-Block

Diameter	IEC	Model Number	Nominal Voltage (V)	Discharge Capacity <sup>*1</sup> (mAh)		Dimensions with Tube (mm)			Approx. Weight (g)
				Average <sup>*2</sup>	Rated (Min.)	Width	Height	Thickness	
E-Block	—	P-169V	8.4	170	160	26.0	48.5	16.3	42

<sup>\*1</sup> After charging at 0.1 CmA for 16 hours, discharging at 0.2 CmA.

<sup>\*2</sup> For reference only.

FT = Flat Top / HT = High Top

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.



## Cylindrical Single Cell

Model Number	Nominal Voltage (V)	Typical Capacity <sup>*1</sup> (mAh)	Dimensions (mm)		Approx. Weight (g)
			Diameter	Height	
CGR-17360	3.6	730	16.9 +0/-0.7	36.0 + 0/-2.0	19
CGR-18500		1,500	18.6 + 0/-0.7	50.0 + 0/-1.0	33
CGR-18650AF "PSS"		2,050	18.6 + 0/-0.7	65.2 + 0/-1.0	43.5
CGR-18650CF "PSS"		2,250			44
CGR-18650D		2,350			45
CGR-18650DA "PSS"		2,450			
CGR-18650E		2,550			46.5

<sup>\*1</sup> 4.2 V charge

## Prismatic Single Cell

Model Number	Nominal Voltage (V)	Typical Capacity <sup>*1</sup> (mAh)	Dimensions (mm)			Approx. Weight (g)
			Width	Height	Thickness	
CGA-103446 "PSS"	3.6	1,800	34.0 +0/-0.6	46.0 + 0/-1.0	10.5 +0/-0.6	35.5
CGA-103450A		1,950		50.0 + 0/-1.0		40
CGA-363443		605		43.0 + 0/-1.0	3.6 +0/-0.6	12.5
CGA-523436B		760		36.0 + 0/-1.0	5.2 +0/-0.6	14.5
CGA-523450C		1,030		50.0 + 0/-1.0		20
CGA-612634		565	26.0 +0/-0.6	34.0 + 0/-1.0	6.1 +0/-0.6	12
CGA-633450B		1,200	34.0 +0/-0.6	50.0 + 0/-1.0	6.3 +0/-0.6	24
CGA-752836		835	28.0 +0/-0.6	36.0 + 0/-1.0	7.5 +0/-0.6	17
CGA-772530		600	25.0 +0/-0.6	30.0 + 0/-1.0	7.7 +0/-0.6	13
CGA-843436		1,150	34.0 +0/-0.6	36.0 + 0/-1.0	8.4 +0/-0.6	23

<sup>\*1</sup> 4.2 V charge



## Battery Pack (Prismatic inside)

Model Number	Nominal Voltage (V)	Typical Capacity (mAh)	Dimensions with tube (mm)			Approx. Weight (g)
			Width	Height	Thickness	
CGA-7/115	3.6	1,200	35.2 + 0.3 /-0.3	53.0 + 0.3 /-0.3	7.0 + 0.3 /-0.3	30
CGA-E/111		1,950			11.0 + 0.3 /-0.3	44

### Caution:

The products detailed above are for introductory purposes only. We regret to advise that we are unable to support single cell business or accept orders from members of the public. Due to the need for careful review when selecting Lithium Ion battery solutions please contact your local Panasonic Sales Office.

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.



# Nickel Cadmium Batteries

Rechargeable  
**1.2V**



## For Cycle Use Applications

Diameter	Size	IEC	Model Number	Nominal Voltage (V)	Discharge Capacity <sup>*1</sup> (mAh)		Dimensions with Tube (mm)		Approx. Weight (g)
					Average <sup>*2</sup>	Rated (Min.)	Diameter	Height	
SC	4/5SC	KR23/34	P-120SCJS/FT <sup>*3</sup>	1.2	1,350	1,200	22.5 ± 0.5	33.0 ± 0.5	37
SC	SC	KR23/43	P-130SCS/FT <sup>*3</sup>		1,450	1,300		42.0 ± 0.5	44
			P-140SCS/FT <sup>*3</sup>		1,550	1,400			
			P-150SCS/FT <sup>*3</sup>		1,600	1,500			
			P-170SCS/FT <sup>*3</sup>		1,800	1,700			
			P-200SCS/FT <sup>*3</sup>		2,100	2,000			52
C	C	KR26/50	P-280CS/FT <sup>*3</sup>		3,000	2,800	25.8 ± 0/-1.0	50.0 ± 0/-1.5	79
D	D	KR33/62	P-500DS/FT <sup>*3</sup>		5,500	5,000	33.0 ± 0/-1.0	61.0 ± 0/-1.5	145

<sup>\*1</sup> 0.2 CmA discharge capacity after charging at 0.1 CmA for 16 hours.

<sup>\*2</sup> For reference only.

<sup>\*3</sup> For high power use applications such as power tools.

## Ni-Cd / Ni-MH Battery Charger

ETYMD282SE3K

- This product is designed to charge battery packs from 4 to 24 cells.
- The charger is optimized for Panasonic batteries.
- 3 charge detection criteria: -dU, dT/dt, Tmax
- Charge current: 2.0A DC

For more technical information please contact Panasonic.



FT = Flat Top  
HT = High Top

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.

## Primary 3V



### Poly Carbonmonofluoride (BR Series) Lithium

Model Number <sup>*1</sup>	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*2</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
BR-1/2AA <sup>*3</sup>	3	1,000	2.5	14.5	25.5	8.0	-
BR-AA <sup>*3</sup> (X)		2,500			50.5	15.0	
BR-2/3A		1,200		17.0	33.5	13.5	BR17335
BR-2/3AG		1,450			45.5	18.0	-
BR-A		1,800					
BR-AG		2,200	5.0	26.0	50.5	42.0	
BR-C		5,000					

<sup>\*1</sup> G indicates higher capacity versions.

<sup>\*2</sup> Based on standard drain and cut off voltage down to 2.0 V at 20 °C.

<sup>\*3</sup> This cell is only available with assembled tab.

(X) under development

## Primary 3V•6V



### Manganese Dioxide (CR Series) Lithium

Model Number	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
CR-2	3	850	20	15.6	27.0	11.0	CR15H270
CR-123A					17.0	34.5	17.0
2CR-5	6	1,400		34.0 <sup>2</sup>	45.0	36.0	2CR5
CR-P2				35.0 <sup>2</sup>	36.0	37.0	CR-P2
CR-AG	3	2,400	2.5	17.0	45.5	22.0	CR17450
CR-AAZ (X)		1,650		14.5	50.5	19.0	CR14500
CR-2/3AZ (X)		1,400		17.0	33.5	17.0	CR17335

<sup>\*1</sup> Based on standard drain and cut off voltage down to 2.0 V at 20 °C...CR2/CR123A.  
Based on standard drain and cut off voltage down to 4.0 V at 20 °C...2CR5/CR-P2.

<sup>\*2</sup> Width

(X) under development

## Primary 3V•6V



### Manganese Dioxide (CR Series) Lithium

Model Number	Nominal Voltage (V)	Nominal Capacity (mAh)	Continuous Standard Drain (mA)	Dimensions (mm)	Approx. Weight (g)	IEC
CR-V3	3	3,300 <sup>*1</sup>	200	29.0 x 14.5 x 52.0 (W) x (T) x (H)	39.0	-

<sup>\*1</sup> Based on standard drain and cut off voltage down to 2.0 V at 20 °C

<sup>\*2</sup> Based on standard drain and cut off voltage down to 4.0 V at 20 °C

## Primary 3V



### Pin Type Poly Carbonmonofluoride (BR Series) Lithium

Model Number	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
BR-425	3	25	0.5	4.2	25.9	0.60	-
BR-435		50	1.0		35.9	0.90	

<sup>\*1</sup> Based on standard drain and cut off voltage down to 2.0 V at 20 °C

**Primary  
3V**



### Poly Carbonmonofluoride (BR Series) Lithium

Model Number <sup>*1</sup>	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
BR-1220	3	35	0.03	12.5	2.0	0.7	–
BR-1225		48			2.5	0.8	BR1225
BR-1632		120		16.0	3.2	1.5	–
BR-2032		190		20.0		2.5	
BR-2325		165		23.0	2.5	3.2	BR2325
BR-2330		255			3.0		–
BR-3032		500		30.0	3.2	5.5	BR3032

<sup>\*1</sup> Based on standard drain and cut off voltage down to 2.0 V at 20 °C.

### Poly Carbonmonofluoride (BR Series) Lithium for High Temperature Usage

Model Number	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
BR-1225A	3	48	0.03	12.5	2.5	0.8	–
BR-1632A		120		16.0	3.2	1.5	
BR-2330A		255		23.0	3.0	3.2	
BR-2450A		600		24.5	5.0	5.9	
BR-2477A		1,000			7.7	8.0	

<sup>\*1</sup> Based on standard drain and cut off voltage down to 2.0 V at 20 °C.

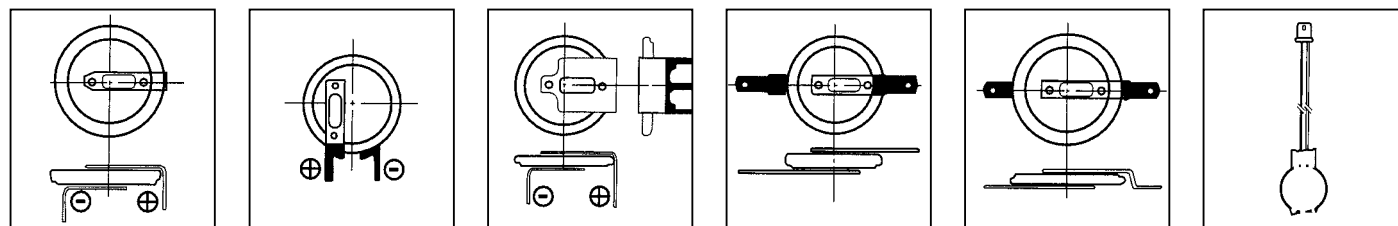
### Manganese Dioxide (CR Series) Lithium

Model Number	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
CR-1025	3	30	0.10	10.0	2.5	0.7	CR1025
CR-1216		25		12.5	1.6		CR1216
CR-1220		35			2.0	1.2	CR1220
CR-1612		40		16.0	1.2	0.8	–
CR-1616		55			1.6	1.2	CR1616
CR-1620		75			2.0	1.3	CR1620
CR-1632		140			3.2	1.8	–
CR-2012		55	0.20	20.0	1.2	1.4	CR2012
CR-2016		90			1.6	1.6	CR2016
CR-2025		165			2.5	2.5	CR2025
CR-2032		220		23.0	3.2	3.1	CR2032
CR-2330		265			3.0	4.0	CR2330
CR-2354		560			5.4	5.9	CR2354
CR-2412		100		24.5	1.2	2.0	–
CR-2450		620			5.0	6.3	CR2450
CR-2477		1,000			7.7	10.5	–
CR-3032		500		30.0	3.2	7.1	CR3032

<sup>\*1</sup> Based on standard drain and cut off voltage down to 2.0 V at 20 °C.



## Typical Terminal Types



H Type

V Type

G Type

T Type

F Type

S Type

Rechargeable  
3V

## Vanadium Pentoxide Lithium (VL Series)

Model Number	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
VL-621	3	1.5	0.10	6.80	2.1	0.27	-
VL-1220		7.0	0.03	12.5	2.0	0.8	
VL-2020		20.0	0.07	20.0		2.2	
VL-2320		30.0	0.10	23.0	3.0	2.7	
VL-2330		50.0				3.5	
VL-3032		100.0	0.20	30.0	3.2	6.2	

\*1 Based on standard drain and cut off voltage down to 2.5 V at 20 °C.

Rechargeable  
3V

## Manganese Lithium (ML Series)

Model Number	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
ML-414	3	1.2	0.005	4.8	1.4	0.09	-
ML-421		2.3	0.003		2.1	0.10	
ML-612		2.6	0.010	6.8	1.2	0.15	
ML-614		3.4			1.4	0.17	
ML-616		2.9			1.6	0.20	
ML-621		5.0			2.1	0.23	
ML-920		11.0	0.030	9.5	2.0	0.40	
ML-1220		17.0		12.5		0.80	
ML-2020		45.0		20.0		2.20	

\*1 Based on standard drain and cut off voltage down to 2.0 V at 20 °C.

Rechargeable  
2V

## Niobium Lithium (NBL Series)

Model Number	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
NBL-414	2.0	1.0	0.008	4.8	1.4	0.10	-
NBL-621		4.0	0.010	6.8	2.1	0.22	

\*1 Based on standard drain and cut off voltage down to 1.0 V at 20 °C.

Rechargeable  
1.5V

## Manganese Titanium Lithium (MT Series)

Model Number	Electrical Characteristics at 20 °C			Dimensions (mm)		Approx. Weight (g)	IEC
	Nominal Voltage (V)	Nominal <sup>*1</sup> Capacity (mAh)	Continuous Standard Drain (mA)	Diameter	Height		
MT-516	1.5	1.15	0.05	5.8	1.6	0.15	-
MT-616		1.05		6.8		2.1	
MT-621		2.50			0.25		
MT-920		5.00	0.10	9.5	2.0	0.45	

\*1 Based on standard drain and cut off voltage down to 1.0 V at 20 °C.

# Valve Regulated (Sealed) Lead-Acid



## LC Series

Model Number <sup>*1</sup>	Nominal Voltage (V)	Rated Capacity (Ah) (20 hour rate)	Usage <sup>*2</sup> Main or Standby Power Supplies	Expected Trickle Life (years) at 20 °C	Dimensions (mm)			
					Length	Width	Height	Approx. Total Height
LC-R061R3P	6	1.3	Main and Standby	6 – 9 years	97	24	50	55
LC-R063R4P		3.4			134	34	60	66
LC-R064R5P		4.5			70	48	102	108
LC-R067R2P		7.2	Standby	10 – 12 years	151	34	94	100
LC-P067R2P								
LC-R0612P		10 – 12 years						
LC-P0612P			15	Main and Standby		6 – 9 years		
LC-R0615P		200	Standby	10 – 12 years				
LC-X06200								
LC-R121R3P	12	1.3	Main and Standby	6 – 9 years	97	47.5	50	55
LC-R122R2P		2.2			Standby	10 – 12 years	177	34
LC-P122R2P			3.4	Main and Standby			6 – 9 years	134
LC-R123R4P		Standby			10 – 12 years			
LC-P123R4P			4.5	Main and Standby		6 – 9 years	70	97
LC-R124R5P		7.2			Standby		10 – 12 years	151
LC-R127R2P			Main and Standby	6 – 9 years				
LC-P127R2P		Standby			10 – 12 years			
LC-RA1212P			12	Main and Standby		6 – 9 years	181	
LC-PA1212P1		Standby		10 – 12 years				
LC-CA1212P		Main		–				
LC-RA1215P		15	Main and Standby	6 – 9 years	165	125	175	179.5/175
LC-CA1215P1			Main	–				
LC-R12EB12P1		16 <sup>*4</sup>	Main and Standby	6 – 9 years	195.6	130	155	180
LC-XD1217P/AP <sup>*5</sup>		17	Standby	10 – 12 years				
LC-X1220P/AP <sup>*5</sup>		20	Main and Standby					
LC-XC1222AP		22	Main	–	197	165	175	180/175
LC-X1224P/AP		24	Standby	10 – 12 years				
LC-X1228P/AP		28						
LC-XC1228P								
LC-R1233P		33	Main and Standby	6 – 9 years	350	166	200	236
LC-V1233P								
LC-X1238P/AP		38	Standby	10 – 12 years	407	173	210	236
LC-XC1238P			Main	–				
LC-X1242P/AP <sup>*5</sup>		42	Standby	10 – 12 years	304	171	210	236
LC-X1265P		65						
LC-X1275P <sup>*5</sup>		75						
LC-XB12100P <sup>*5</sup>		100						
LC-X12120P		120						

<sup>\*1</sup> Contact Panasonic for the country of origin on each battery.

<sup>\*2</sup> If you use power supplies as a main power source, please contact Panasonic regarding charging specifications.

<sup>\*3</sup> Height of Faston 250 type is 101.5 mm

<sup>\*4</sup> Capacity: 16 Ah – 20 h discharge / 12 Ah – 3 h discharge

<sup>\*5</sup> This battery is also available with a flame retardant battery case resin.

Valve Regulated (Sealed) Lead-Acid

Battery Types and Model Numbers

For main power source

For main and standby power source

For standby power source

Cycle long life type → LC-XC, LC-C

Trickle Design life 6-9<sup>\*)</sup> years → LC-R, LC-V

Trickle Design life 6-9<sup>\*)</sup> years → UP-RW

Trickle Design life 10-12<sup>\*)</sup> years

Trickle Design life 17<sup>\*)</sup> years → LC-QA

Standard case → LC-X

Flame-retardant case → LC-P, UP-PW

Trickle Design life:

■ Temperature: 20 °C

■ Discharge current: 0.1 CA

■ Discharge ending voltage: 5.4 V for 6 V battery, 10.8 V for 12 V battery

■ Charge voltage: 6.85 V for 6V battery, 13.7 V for 12 V battery

\*) Trickle Design life conform to Eurobat

Approx. Mass (kg)	Terminal Types		Battery-case Resin		<div>VdS</div> <div>VdS N°</div>
			Standard (UL94HB)	Flame-retardant (UL94V-O)	
0.30	Faston 187		√		-
0.62			√		-
0.72			√		-
1.26	Faston 187 or Faston 250 with hole		√		-
1.30	Faston 187			√	-
2.00	Faston 187 or Faston 250 with hole		√		-
				√	-
2.10			√		-
41.00	M10 bolt and nut		√		-
0.59	Faston 187		√		G196049
			√		G188151
0.80				√	-
1.20			√		G191053
				√	-
1.45			√		-
2.47	Faston 187 or Faston 250 with hole		√		G193046
2.50				√	-
			√		G100001
3.80	Faston 250 with hole			√	-
	Faston 187 or Faston 250 with hole		√		-
4.20			√		-
			√		-
4.30	Faston 250 with hole		√		-
6.50	LC-XD1217P: M5 bolt and nut	LC-XD1217AP: M5 threaded post	√		G104101
6.60	LC-X1220P: M5 bolt and nut	LC-X1220AP: M5 threaded post	√		-
6.50	M5 threaded post		√		-
9.00	LC-X1224P: M5 bolt and nut	LC-X1224AP: M5 threaded post	√		G198049
11.00	LC-X1228P: M5 bolt and nut	LC-X1228AP: M5 threaded post	√		-
10.00	M5 bolt and nut		√		-
12.00	M6 bolt and nut		√		-
11.10				√	-
13.00	LC-X1238P: M6 bolt and nut	LC-X1238AP: M5 threaded post	√		G100002
15.00	M6 bolt and nut		√		-
16.00	LC-X1242P: M6 bolt and nut	LC-X1242AP: M5 threaded post	√		-
20.00	M6 bolt and nut		√		G199090
24.00			√		-
37.00	M8 bolt and nut		√		-
37.00			√		-

VRLA

10

# Valve Regulated (Sealed) Lead-Acid

## Battery Types and Model Numbers

For main power source	Cycle long life type → LC-XC, LC-C
For main and standby power source	Trickle Design life 6-9 <sup>*)</sup> years → LC-R, LC-V
For standby power source	Trickle Design life 6-9 <sup>*)</sup> years → UP-RW Trickle Design life 10-12 <sup>*)</sup> years → LC-X Trickle Design life 17 <sup>*)</sup> years → LC-QA Standard case → LC-X Flame-retardant case → LC-P, UP-PW

### Trickle Design life:

- Temperature: 20 °C
- Discharge current: 0.1 CA
- Discharge ending voltage: 5.4 V for 6 V battery, 10.8 V for 12 V battery
- Charge voltage: 6.85 V for 6V battery, 13.7 V for 12 V battery

<sup>\*)</sup> Trickle Design life conform to Eurobat



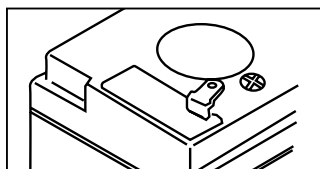
## UP-RW Series (High power type for standby power supplies)

Model Number <sup>*1</sup>	Nominal Voltage (V)	Rated Power (W) (10 minute rate)	Usage <sup>*2</sup> Main or Standby Power Supplies	Expected Trickle Life (years) at 20 °C	Dimensions (mm)				Approx. Mass (kg)	Terminal Types	Battery-case Resin
					Length	Width	Height	Approx. Total Height			
UP-RW0645P1	6	135	Standby	6 – 9 years	151	34	94	100	1.30	Faston 250 with hole	Standard (UL94HB)
UP-RW1220P1	12	120			140	38.5			1.35		
UP-RWA1232P1/P2		192			151	51			2.00	Faston 250 with hole or Faston 187 / Faston 250 mixed	
UP-RW1245P1		270		64.5		2.60			Faston 250 with hole		
UP-PW1245P1										10 – 12 years	Flame-retardant (UL94V-O)

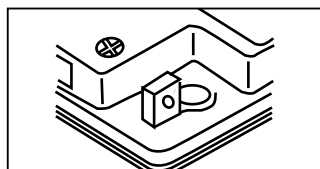
<sup>\*1</sup> Contact Panasonic for the country of origin on each battery.

<sup>\*2</sup> If you use power supplies as a main power source, please contact Panasonic regarding charging specifications.

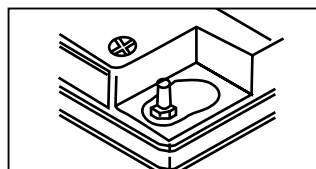
## Terminal Types (Examples)



Faston Type



Bolt and Nut Type



Threaded Post Type

## LC-QA Series

Model Number <sup>*1</sup>	Rated Voltage (V)	Rated Capacity (Ah)	Expected Service Life at 20 °C	Dimensions (mm)				Approx. Mass (kg)	Battery-case Resin	VdS VdS N°
				Length	Width	Height	Approx. Total Height			
LC-QA1224	12	24	17 years	165	125	175	175	10	Flame-retardant (UL94V-O)	–
LC-QA1242		42		197	165	175	180	16		–
LC-QA1265		65		350	166	175	175	24		–
LC-QA12100		100		407	173	210	236	37		–
LC-QA12120		120						44		–
LC-QA06200	6	200					250	37		–

<sup>\*1</sup> Contact Panasonic for the country of origin on each battery.

<sup>\*2</sup> If you use power supplies as a main power source, please contact Panasonic regarding charging specifications.



## **Panasonic brings the first Super Life lead-acid batteries with a 17 year service life to Europe**

*Manufactured in China to international standards  
for environmental protection and occupational safety.*

Panasonic is extending its comprehensive range of industrial batteries still further with the new "Super Life" models. The hallmarks of these six new VRLA batteries of the LC-QA series, with capacities of between 24 and 200 ampere hours (Ah), are a very long service life of 17 years (at 20 degrees Celsius) and

excellent product quality. The main area of application is the telecommunications industry. The batteries are produced at the Chinese factory in Shenyang that has received accreditation for its particular commitment to environmental protection and social responsibility toward its staff.



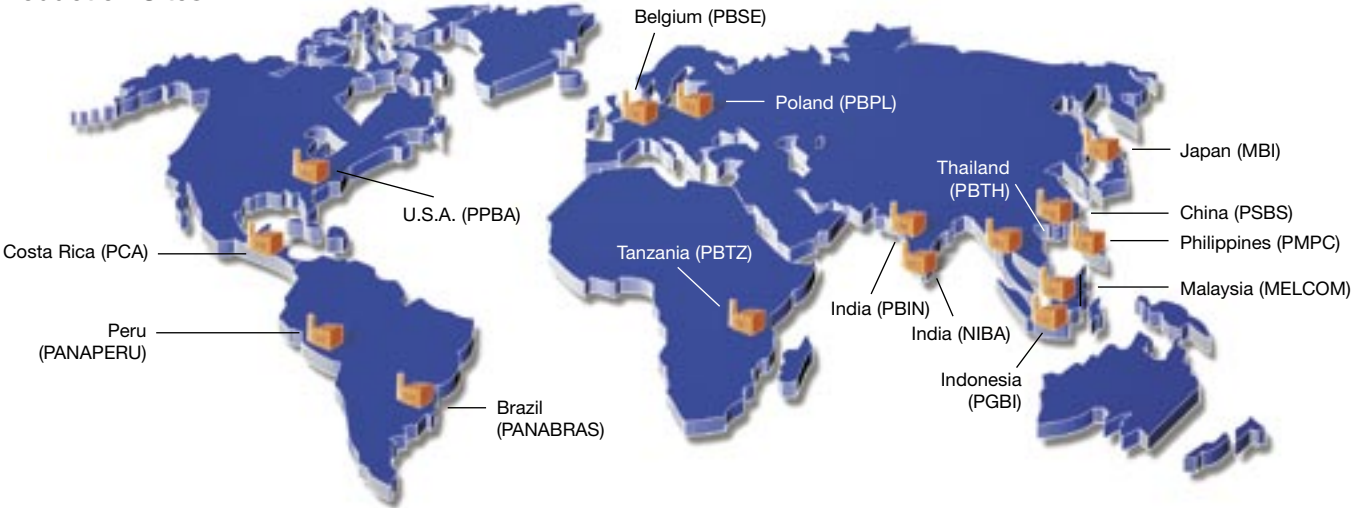
Zinc Carbon, Alkaline

Primary  
1.5V•9V



Size	Model Number		Nominal Voltage (V)
	Zinc Carbon	Alkaline	
D	R20	LR20	1.5
C	R14	LR14	
AA	R6	LR6	
AAA	R03	LR03	
N	R1	LR1	
9V	6F22	6LR61	9

Production Sites:



Worldwide Production Sites and Products

Location	Factory	Managanese Battery						Alkaline Battery					
		R20	R14	R6	R03	R1	6F22	LR20	LR14	LR6	LR03	LR1	6LR61
Japan	MBI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Thailand	PBTH	✓	✓	✓									
Philippines	PMPC	✓		✓									
Malaysia	MELCOM	✓		✓									
Indonesia	PGBI	✓	✓	✓	✓								
India	PBIN	✓	✓	✓									
India	NIBA	✓	✓	✓									
Costa Rica	PCA	✓	✓	✓									
Peru	PANAPERU	✓		✓									
Brazil	PANABRAS	✓	✓	✓						✓			
Belgium	PBSE							✓	✓	✓	✓		✓
Tanzania	PBTZ	✓											
U.S.A.	PPBA							✓	✓	✓	✓		✓
China	PSBS	✓		✓			✓						
Poland	PBPL	✓	✓	✓									

# Memory Cards

## Cards



### Full-size Flash ATA Card

Parts Number	Memory Capacity (bytes)	Number of Cylinders	Number of heads	Number of Sectors/ Tracks	Number of Sectors	Current Consumption	Operating Temperature (°C)	Storage Temperature (°C)	Dimensions (mm)	Number of Pins
BN-016AC-G	16,384,000	1,000	2	16	32,000	Typ.30	0 to 60	-30 to 80	PC Card TYPE 2 85.6 * 54.0 * 5.0	68
BN-032AC-G	32,768,000	500	8		64,000					
BN-048AC-G	49,152,000	750			96,000					
BN-096AC-G	98,304,000		32	192,000						
BN-128AC-G	131,072,000	500		256,000						
BN-256AC-G	262,144,000	1,000		512,000						



### Full-size Flash Memory Card

Parts Number	Common Memory (bytes)	Attribute Memory (bytes)	Access time (ns)	Current Consumption	Operating Temperature (°C)	Storage Temperature (°C)	Dimensions (mm)	Number of Pins
BN-08MHFCC	8M	EEPROM:8K	250	Max. 150	0 to 60	-30 to 80	PC Card TYPE 1 85.6 * 54.0 * 3.3	68



### Full-size SRAM Card

Parts Number	Memory Capacity (bytes)	Access time (ns)	Current Consumption	Battery Life (25 °C)	Sub Battery	Operating Temperature (°C)	Storage Temperature (°C)	Dimensions (mm)
BN-064HSR	64K	200	Max. 150	5 years	Built-in	0 to 60	-20 to 70	PC Card TYPE 1 85.6 * 54.0 * 3.3
BN-128HSR	128K							
BN-256HSR	256K							
BN-512HSR	512K							
BN-01MHSR	1M			3 years				
BN-02MHSR	2M							
BN-04MHSR	4M							
BN-08MHSR	8M							

## Adapter



### PC Card Adapter for small PC Card

Parts Number	Dimensions (mm)
BN-SPCADP	85.6 * 54.0 * 5.0

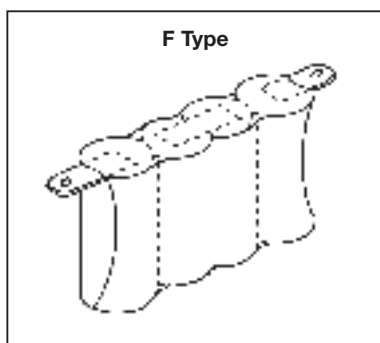
## Battery Packs

Panasonic can provide specially designed battery pack solutions to meet all our customers energy needs. The requirements of the application, such as charge specifications, available space and operating conditions can determine the type of battery, number of cells and shape of the pack. At Panasonic we are working on the promotion of battery packs which empha-

size the safety and reliability of the batteries. We can create customised packs to satisfy the unique requirements of each of our customers and are able to design and produce battery packs of all chemistries.

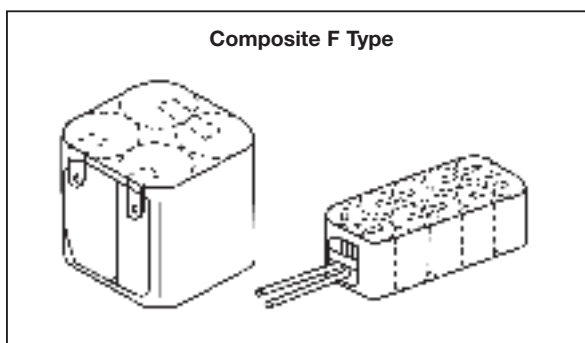
Do not hesitate to contact us regarding your specific needs.

### Shapes of Battery Packs (Typical & Standard Types)



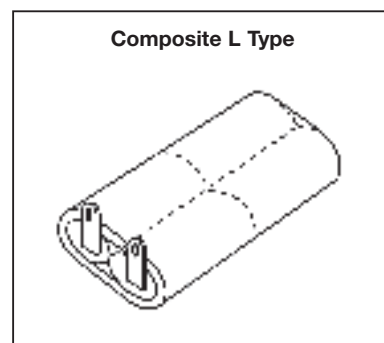
#### F Type

The required number of single cells are arranged side by side along their diameter, connected by nickel plates, and packed together with heat-shrinkable tubing.



#### Composite F Type

Single cells are connected in the F type configuration but in two to five rows rather than one row and packed together by heat-shrinkable tubing.



#### Composite L Type

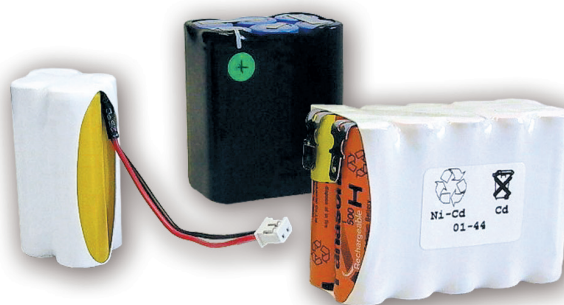
Single cells connected in the L type configuration are further connected in two to five rows, and packed together by heat-shrinkable tubing.

### Special Pack Shapes

Panasonic can meet customers' needs for customized specifications (such as battery packs in plastic resin cases).

This applies also to prismatic battery packs.

Please contact Panasonic for detailed discussions concerning design-in, specifications, lead times, etc.

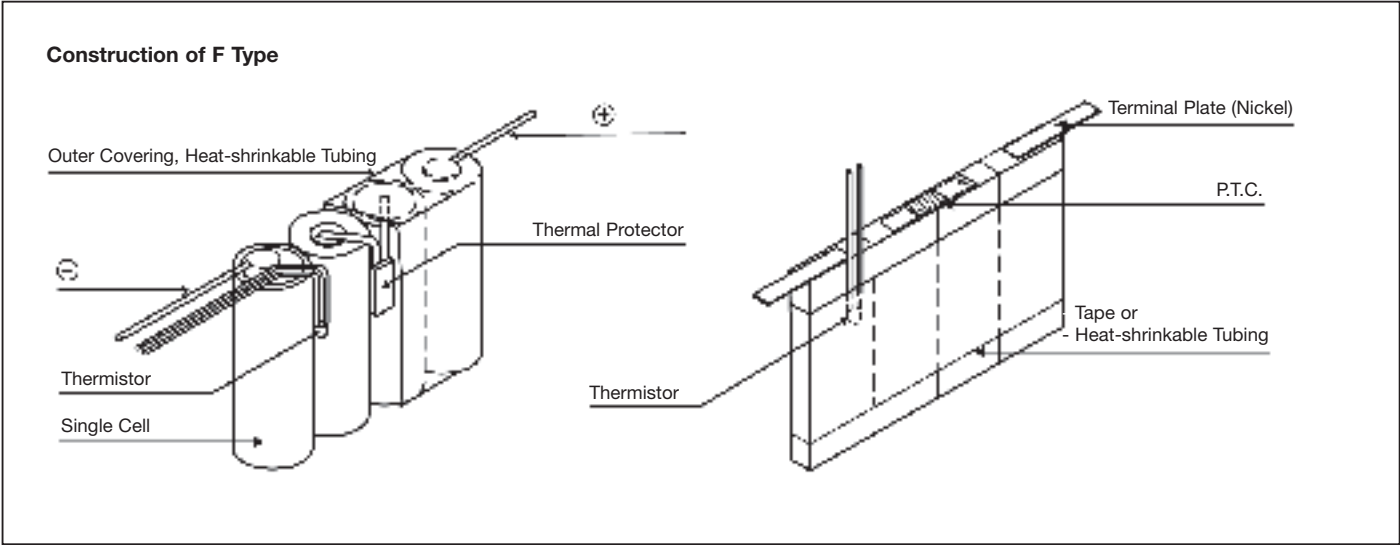


Examples of Battery Pack Constructions

Construction of Ni-MH Battery Packs

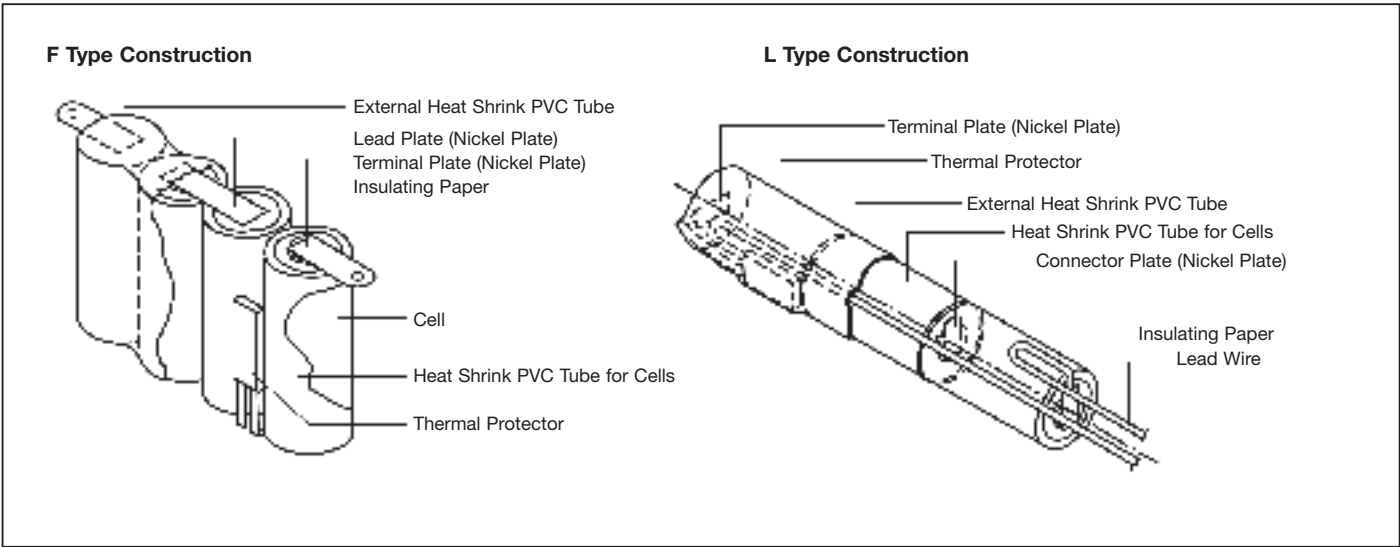
The figure below shows the basic construction of a battery pack. It is recommended that a thermal protector, which is used for temperature detection and external short-circuiting, be installed

in a nickel-metal hydride battery pack to prevent any rise in the temperature of the pack.



Construction of Ni-Cd Battery Packs

The basic constructions for battery packs are as shown below.









# Panasonic ideas for life

## For Literature and General Product Information:

### United Kingdom/Ireland

Panasonic Industrial Europe GmbH  
Willoughby Road  
Bracknell Berkshire  
RG12 8FP  
England  
Tel: +44 1344-85 32 60  
Fax: +44 1344-85 33 13

### Italy

Panasonic Industrial Europe GmbH  
Via Lucini 19  
20125 Milano  
Tel: +39 02-6788-232  
Fax: +39 02-6788-207

### Spain

Panasonic Industrial Europe GmbH  
Avda. Josep Tarradellas, 20-30, 5º  
08029 Barcelona - Spain  
Tel: +34 93-494 92 42  
Fax: +34 93-419 89 31

### Germany

#### (all other european countries)

Panasonic Industrial Europe GmbH  
Winsbergring 15  
22525 Hamburg  
Tel: +49 40-85 386-157  
Fax: +49 40-85 386-238

### France

Panasonic Industrial Europe GmbH  
1 – 3 Avenue François Mitterrand  
93218 Saint-Denis La Plaine  
Tel: +33 1-55 93 67 10  
Fax: +33 1-55 93 67 90

### E-mail and Website for all countries:

[battery-solutions@eu.panasonic.com](mailto:battery-solutions@eu.panasonic.com)  
[www.panasonic-industrial.com/batteries](http://www.panasonic-industrial.com/batteries)

### Notice to Readers

It is the responsibility of each user to ensure that every battery application is adequately designed safe and compatible with all conditions encountered during use, and in conformance with existing standards and requirements.

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