

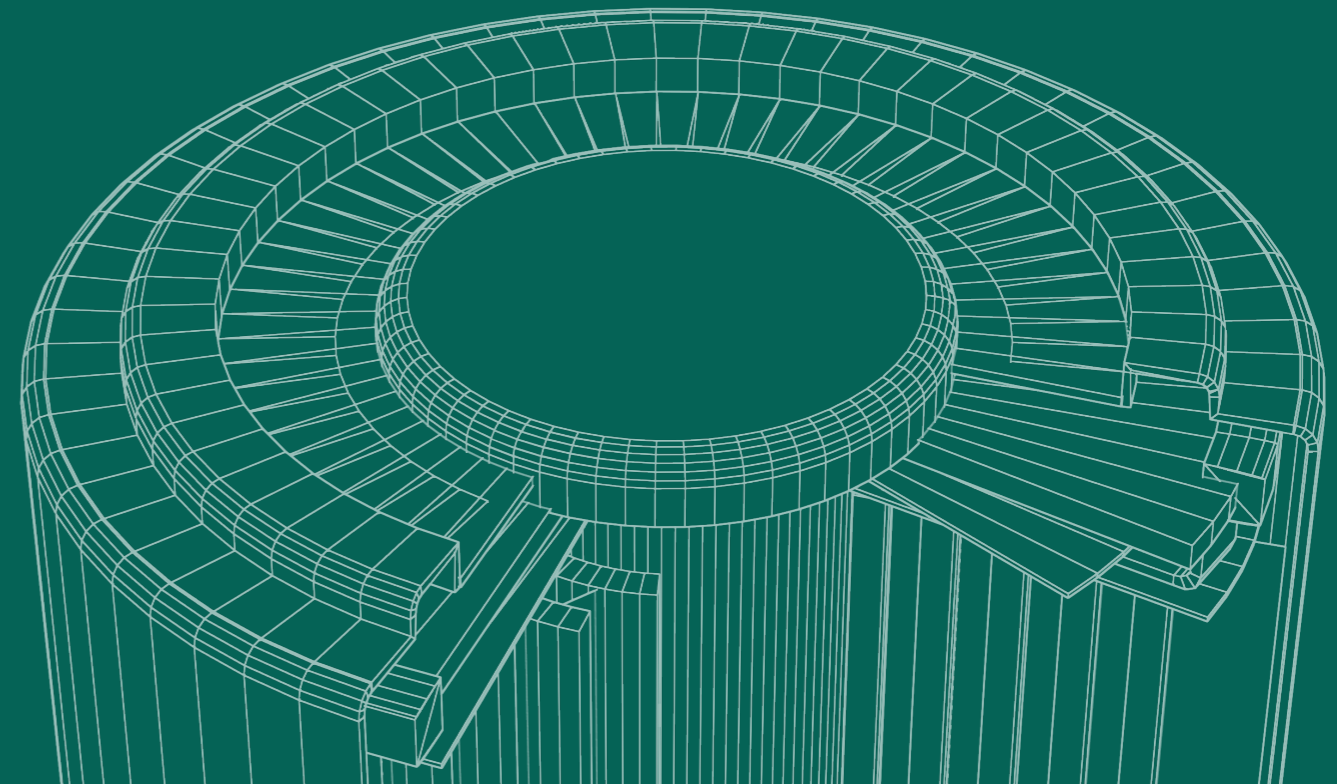


WE POWER YOUR  
**IDEAS**



# FIND THE RIGHT CONTENT

This Short Form Catalog provides you with a concise insight into our company and battery product range. For detailed information on individual products, we kindly invite you to visit our **homepage**. There, you will find comprehensive product descriptions, technical details, certifications and much more, including our Mediapool with product images, manuals, etc. – available for free download.



NICKEL-METAL-HYDRIDE

22



LITHIUM-ION

32



LITHIUM

40

# ONE OF THE WORLD'S LARGEST BATTERY MANUFACTURERS

The Panasonic Energy Co., Ltd. is globally active in our consumer battery business that supports everyday convenience and comfort, as well as our B2B business such as industrial batteries and automotive batteries that support social infrastructure across a broad area.



## 17 NET ZERO FACTORIES\*1

Our goal is to produce our products with zero emissions by 2050. Already today, our batteries are manufactured "net-zero" in 17 factories. Find out more on page 6.

## ABOUT PANASONIC ENERGY

BATTERY PRODUCTION  
SINCE **1931**

17 FACTORIES\*1  
**NET ZERO**

ABOUT  
**21,000**\*2  
EMPLOYEES

**21**  
SITES

**Panasonic**  
**ENERGY**

**0** NUMBER OF  
SERIOUS  
PRODUCT  
ACCIDENTS\*4

**12**  
SALES OFFICES

NET SALES  
**873.2**\*3  
BILLION

PATENTS APPROX.  
**11,000**

ADJUSTED  
OPERATING PROFIT  
**122.7**\*3  
BILLION

## CEO'S MESSAGE

The Panasonic Energy Co., Ltd. is globally active in our dry battery business that supports everyday convenience and comfort, as well as our B2B business such as industrial batteries and automotive batteries that support social infrastructure across a broad area.

For over 100 years we have been focusing on building a better world through electricity, providing solutions with our energy business centered on batteries to the social challenges of lifestyles in each era. Earnestly seeking to come to grips with the environmental issues confronting the world now and in the future, our quest continues under our mission of achieving a sustainable society harmonizing enriched lifestyles with the environment.

With this aim in mind, we are expanding our business rapidly and flexibly to adapt to the increasing complexity and diversity of this age of change, based on our reservoir of technology development capabilities and high product quality. Buoyed by the powerful determination that we are doing what humankind requires to humanity to change the future, we are concentrating all our might to further evolve our technology, going beyond the standard concept of batteries to create a completely new type of value.

Panasonic Energy Co., Ltd., President, CEO, Kazuo Tadanobu [Excerpt from the Panasonic Energy website]

\*1 March 2025

\*2 Consolidated, as of March 31, 2025

\*3 FY 2025\* refers to the year ending March 31, 2025

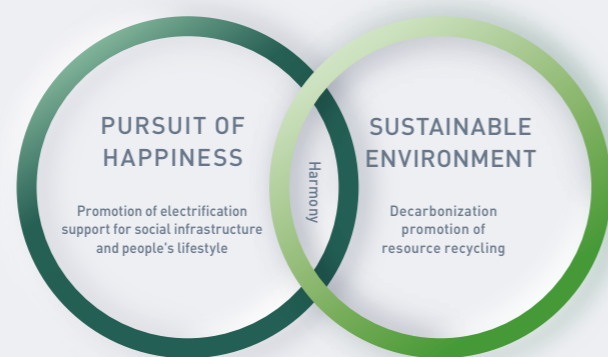
\*4 Zero battery-attributed recalls of automotive Lithium-ion batteries

## PROMOTING SUSTAINABILITY MANAGEMENT

Panasonic Energy will contribute to the realization of a sustainable society, aiming to "Powering a society where shared well-being and environmental sustainability thrive together." In cooperation with various stakeholders, we will work on material issues(materiality) such as decarbonization, human capital management, and strengthening governance, and strive to improve corporate value.

### WE AIM FOR

Powering a society where shared well-being and environmental sustainability thrive together.



## ESG PROMOTION STRUCTURE

Panasonic Energy established its ESG Committee, chaired by the President, to formulate an overall ESG plan, monitor its progress, and evaluate its achievement status. In addition, based on the outcomes of its deliberations, the Committee makes annual reports and recommendations to the Board of Directors to ensure that ESG considerations are integrated into the management decision-making process.

In promoting specific measures, we designate Executive Officer, or other person to take charge of addressing each of the seven material issues, set medium- to long-term visions and key performance indicators (KPIs) for each material issue, and formulate action plans to achieve them. Based on progress reports from the aforementioned persons in charge, the ESG Committee monitors and evaluates activities, estimates the effectiveness of measures, and encourages their improvements. In these ways, we have established the PDCA cycle throughout the year.

In fiscal 2025, in addition to confirming the results of the previous fiscal year and reviewing progress, we conducted interim reviews of the three material issues that are particularly important for improving our company's growth potential—namely achieving decarbonization, realizing a circular society, and promoting human capital management and respecting for human rights— to identify any issues and advance the steady implementation of corrective measures. The issues we identified include: responding to increasingly complex laws and regulations and customer requirements, enhancement of non-financial goal setting and management, and instilling ESG values among our employees. The Company has therefore resolved to redouble its efforts on each of these issues with the goal of achieving ESG-focused management that leverages growth.

## OUR MISSION

Powering a society where shared well-being and environmental sustainability thrive together.

## OUR VISION

Be the energy that shapes the future.

## OUR WILL

As humanity, we push beyond.



Environmental management



Net zero factories



Global warming prevention



Resource recycling



Environmental communication



Environmental performance

At Panasonic Energy we offer diverse services intended to make the customer's life easier. Find the right pictures and media files in our Mediapool, gain insight into battery technology in our handbooks and white papers and be entertained by watching amazing videos at our YouTube Channel. Test our services!

# YOUR SERVICES TO FIND



## YOUTUBE CHANNEL – OUR MOVIE STARS

We've completely reimagined our YouTube presence — new look, new structure, and fresh content tailored to your interests. Dive deeper in the Panasonic world of batteries and explore in particular our application videos and find out how our batteries power innovations in IoT, Green Energy technologies, and the automotive industry.



Discover more on our YouTube channel



## MEDIAPOOL – OUR MEDIA LIBRARY

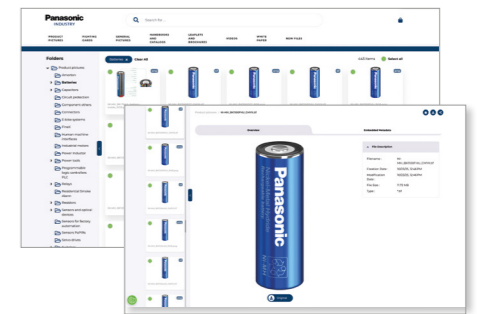
Our Mediapool offers a wide range of white papers, videos, catalogs, and handbooks. In addition, you'll find the latest product line-up images available in various formats. Curious? Explore our Mediapool for comprehensive information.



Your direct way to our Mediapool



Watch introduction video and get an idea of how to use the Mediapool



## WHITE PAPER – FOR DEEP INSIGHTS

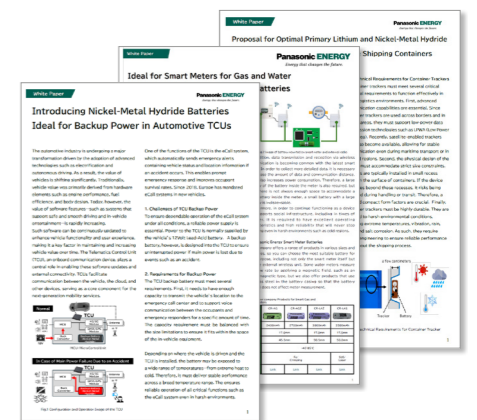
Our Mediapool offers different white papers on batteries, designed to help you to get further technical aspects of our battery business. Our white papers cover topics such as IoT, smart metering, and medical applications.



Get your white paper directly



Get your white paper directly



# WE POWER YOUR INDUSTRY APPLICATION

In a world that is constantly changing and offering new opportunities, it is often the idea that makes the difference. Our mission is to understand your ideas, support them and implement them together with you. Whether you are looking for creative impulses or already have a clear vision – we are here to help you find the right solution.



AUTOMOTIVE



MEDICAL



SMART BUILDING



IOT

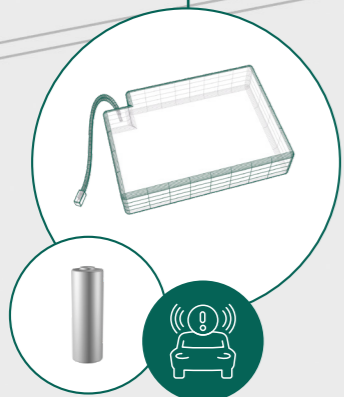
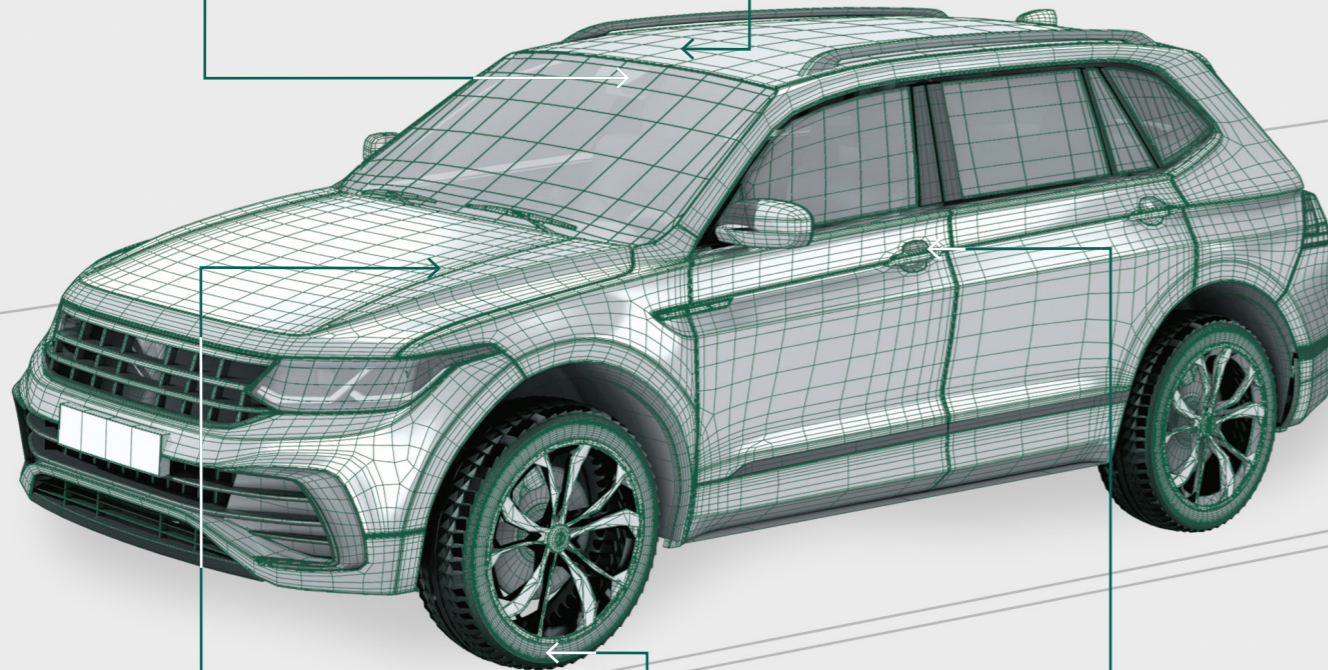
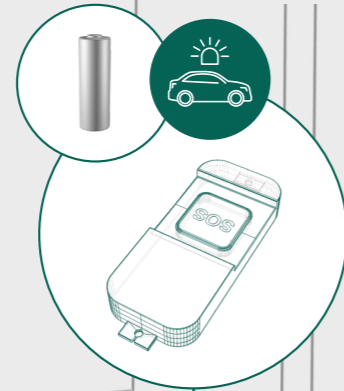
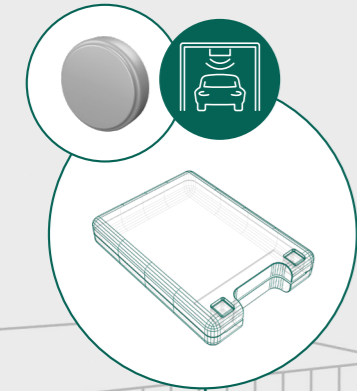


GREEN

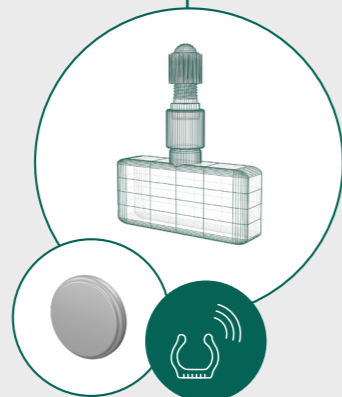
FIND OUT, HOW WE CAN  
SUPPORT YOUR BUSINESS!

Electronic Toll  
Collection (ETC)  
CR2450B

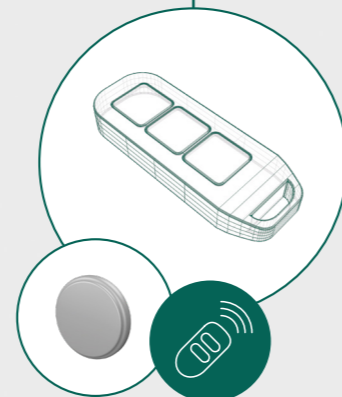
Telematic Control Unit (TCU) -  
Emergency call (E-call)  
BK120AAWX



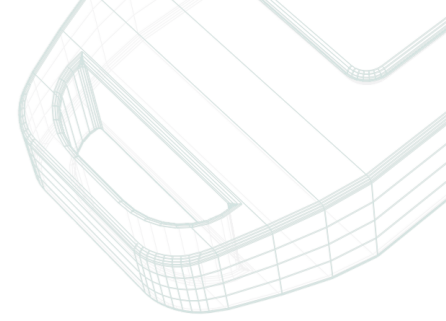
Car alarm  
BK120AAWX



Tire Pressure Monitoring  
System (TPMS),  
Tire Management Systems (TMS)  
CR2032A



Remote Keyless  
Entry (RKE)  
CR2032



## INDUSTRY APPLICATION AUTOMOTIVE

Nowadays mobility is still the key for human beings life. Panasonic batteries are designed to cope with the special demands of automotive applications in order to support safety and comfort in daily life. With our wide range of manufactured chemistries Panasonic can offer suitable solutions for your application. For more insights, watch out our YouTube video on automotive applications.



### FEATURES

- | High reliability & robustness
- | Easy transportation (Ni-MH)
- | Wide temperature range
- | IATF 16949 certified factories
- | Decades of mass production experience

### OUR RECOMMENDATION



**BK120AAWX**  
page 30



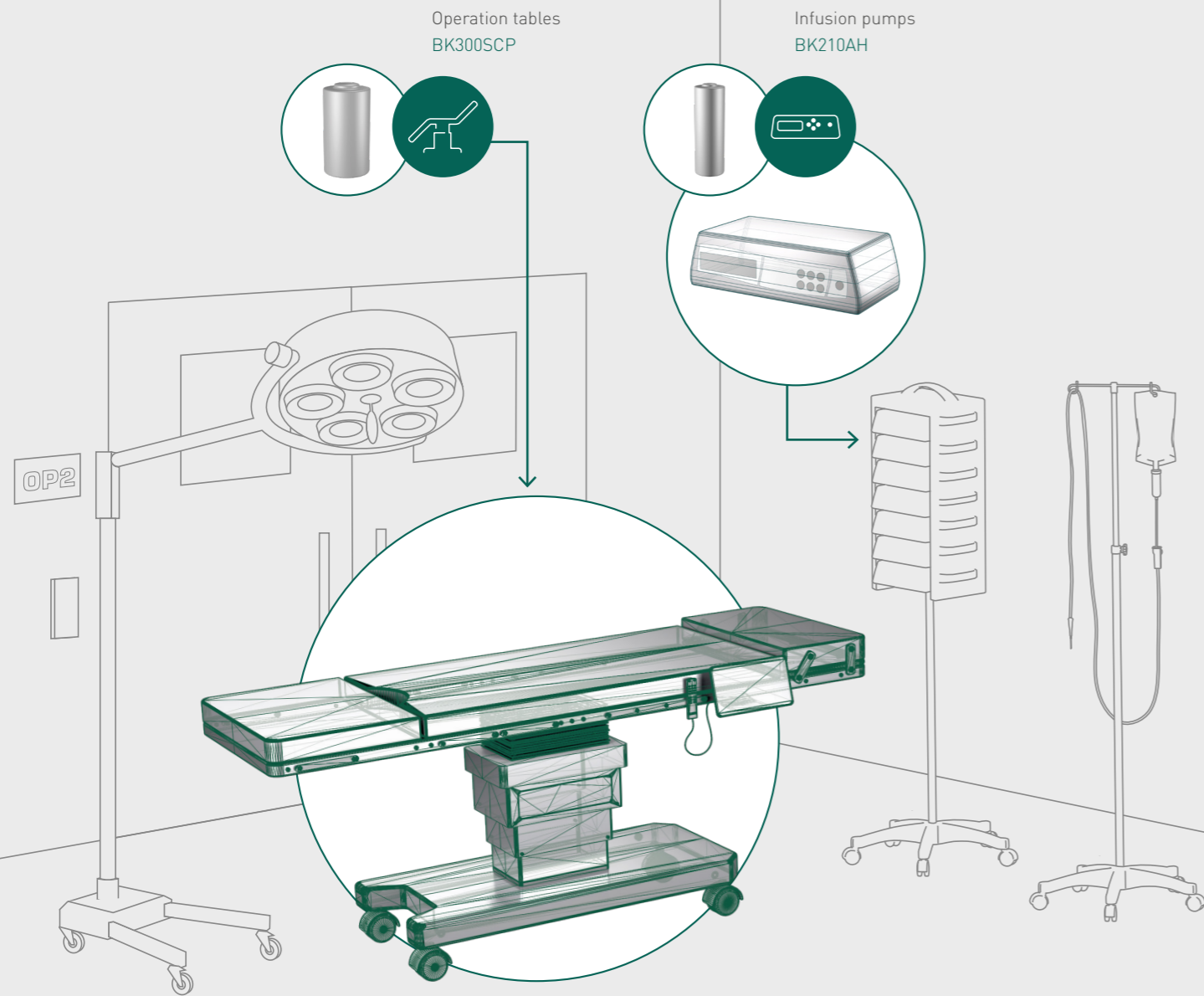
**CR2450B**  
page 54



**CR2032**  
page 53



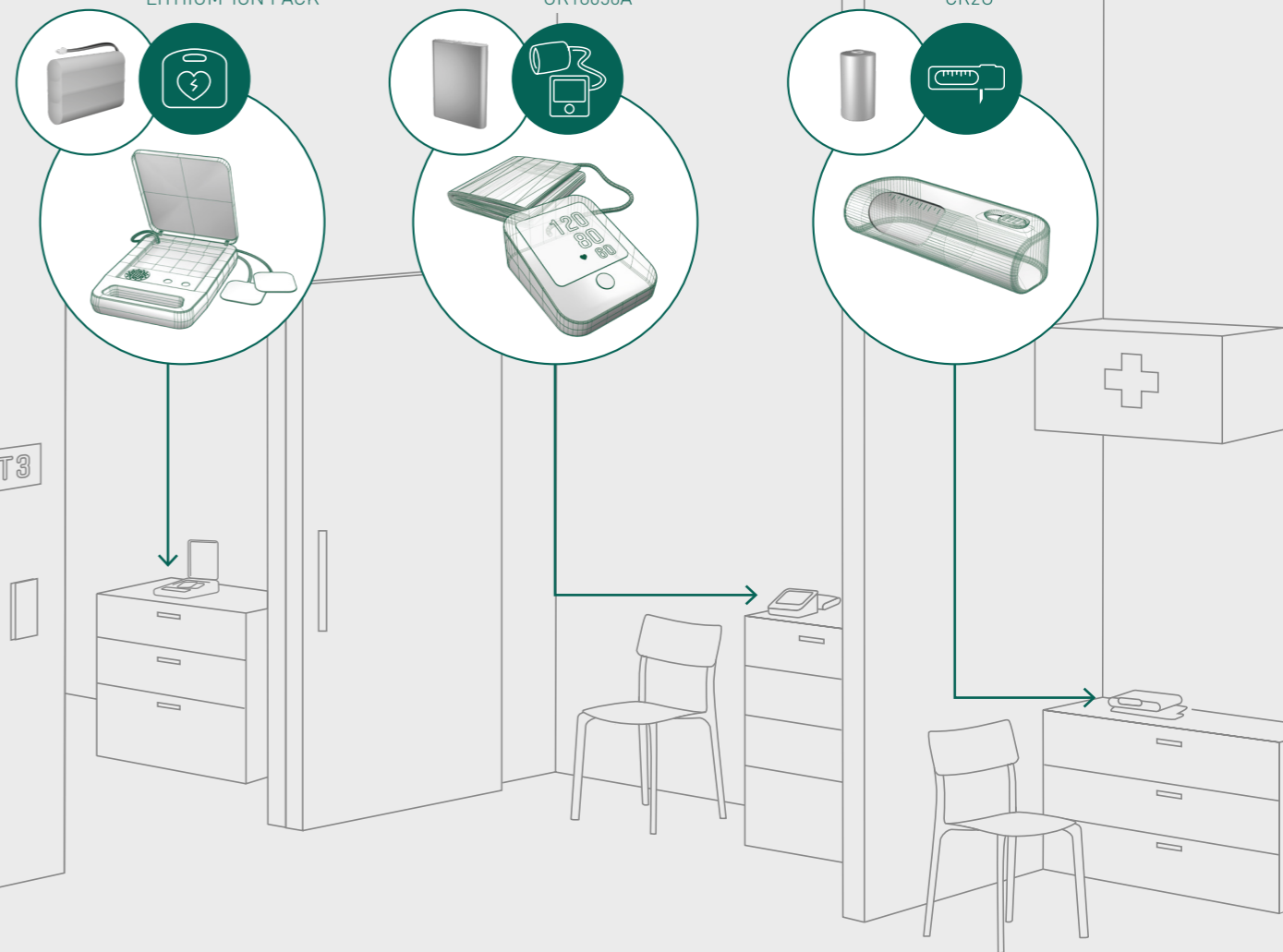
**CR2032A**  
page 54



Defibrillator  
LITHIUM PRIMARY /  
LITHIUM-ION PACK

Blood pressure meters  
NCA463436A  
UR18650A

Electronic drug  
injectors  
CR2U



## INDUSTRY APPLICATION MEDICAL

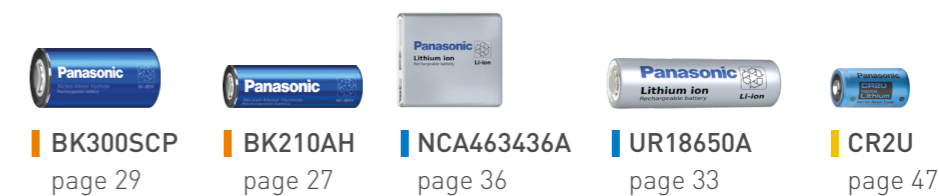


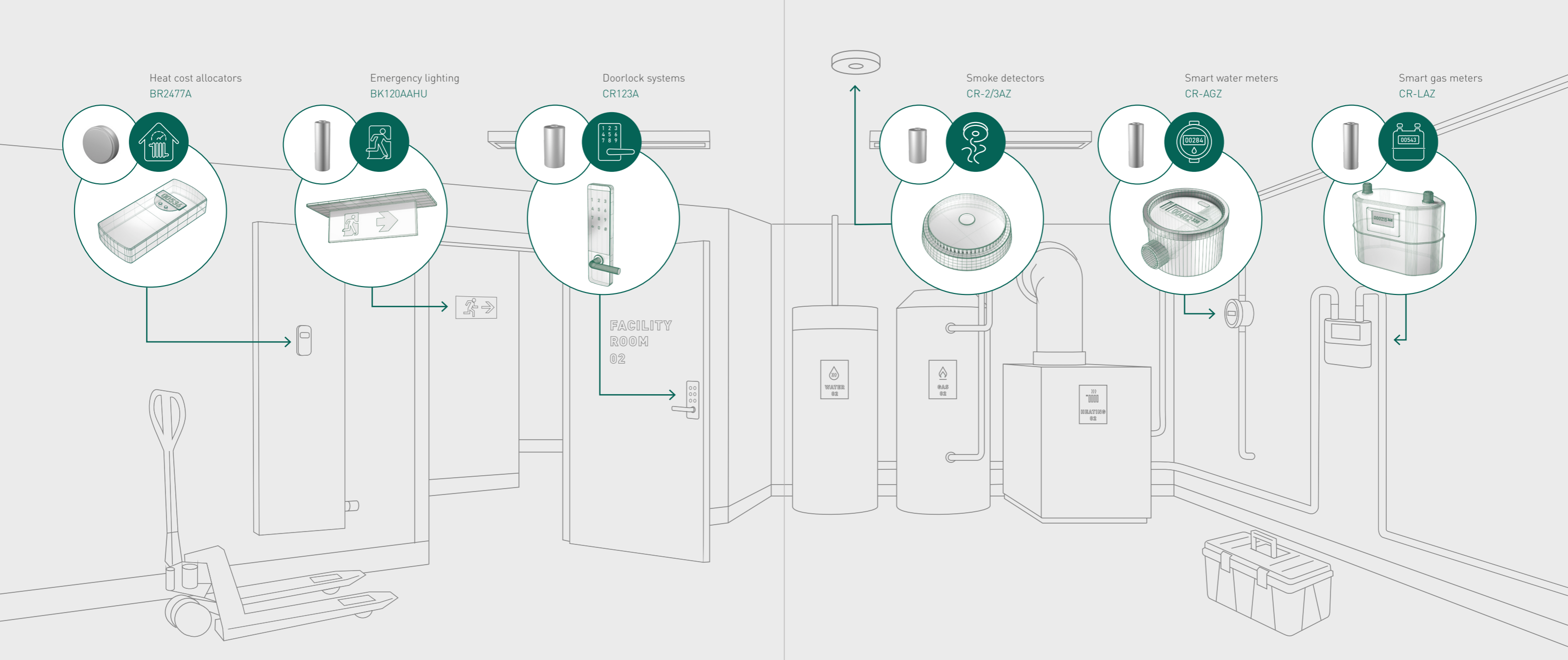
Public and personal health is absolutely crucial to everyone. Ensuring the patients well being by powering state-of-the-art medical devices with Panasonic batteries is our aspiration. Reliable and safe medical products can count on Panasonic's long experience and superior quality. For more insights, watch out our YouTube video on medical applications.

### FEATURES

- | Panasonic batteries help to miniaturize your device
- | Decades of experience in the medical market
- | Highest internal quality standards to ensure safe products

### OUR RECOMMENDATION





## INDUSTRY APPLICATION SMART BUILDING



For comfortable living and working and to minimize maintenance service efforts as well as costs devices became smart. To guarantee trouble-free data security, utility meters need a reliable power source. Panasonic Lithium batteries are ideal for long-term use in applications with different temperature requirements. For more insights, watch out our YouTube video on smart building / IoT applications.

### FEATURES

- | Wide temperature range (-40 to 125°C)
- | Low self-discharge
- | Wide product range to meet customer needs
- | Stable connectivity over committed lifetime

### OUR RECOMMENDATION



**BR2477A**  
page 51



**CR-AGZ**  
page 47



**CR-LAZ**  
page 47



**CR-2/3AZ**  
page 47



**CR123A**  
page 46



**BK120AAHU**  
page 29

# INDUSTRY APPLICATION IOT



The access to information of your assets is becoming more and more important at present. A stable connectivity network enables planning, measuring, tracking, positioning and monitoring of your business and service activities. Panasonic batteries offer reliable power supply in your daily business. For more insights, watch out our YouTube video on smart building / IoT applications.

## FEATURES

- | Wide product range to meet your applications lifetime requirements
- | Panasonic Lithium technology deliver high pulse currents even after long periods
- | Powerful Lithium batteries to energize Low Power Wide Area (LPWA) networks

## OUR RECOMMENDATION



**CR2330**  
page 53



**CR-LAZ**  
page 47



**BK1100FHU**  
page 30

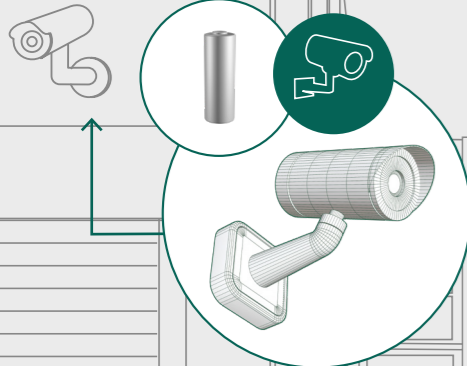


**CR2Z**  
page 47



**NCR2270A**  
page 34

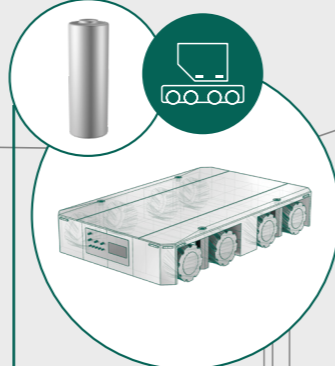
CCTV (Closed-Circuit Television) Camera  
NCR2270A



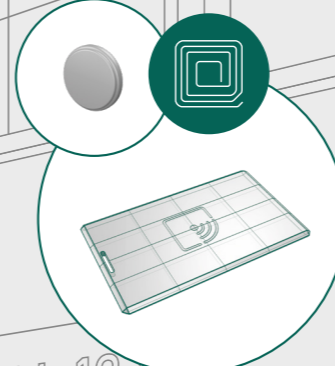
Active cooling and tracking for airfreight  
BK1100FHU



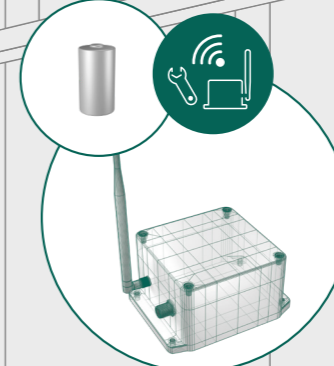
Industrial truck robots  
BK1100FHU



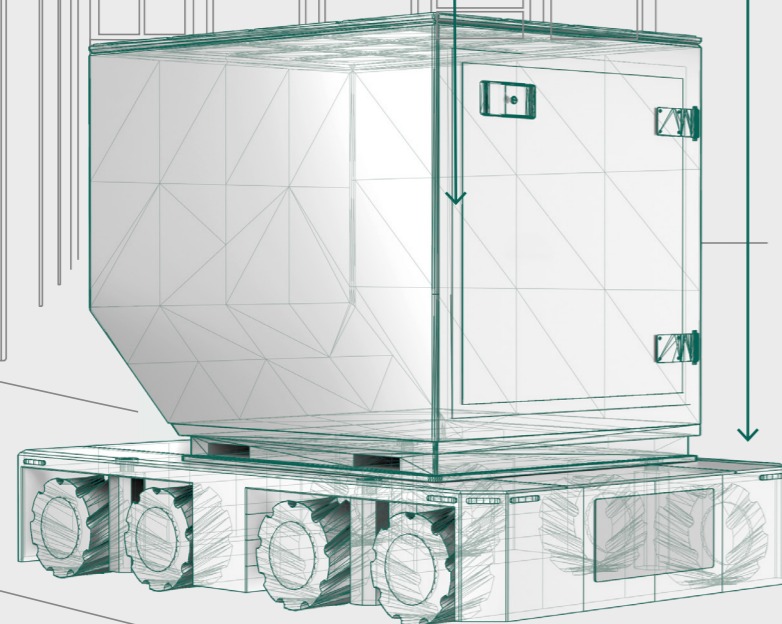
RFID tracking  
CR2330



Predictive maintenance  
CR2Z

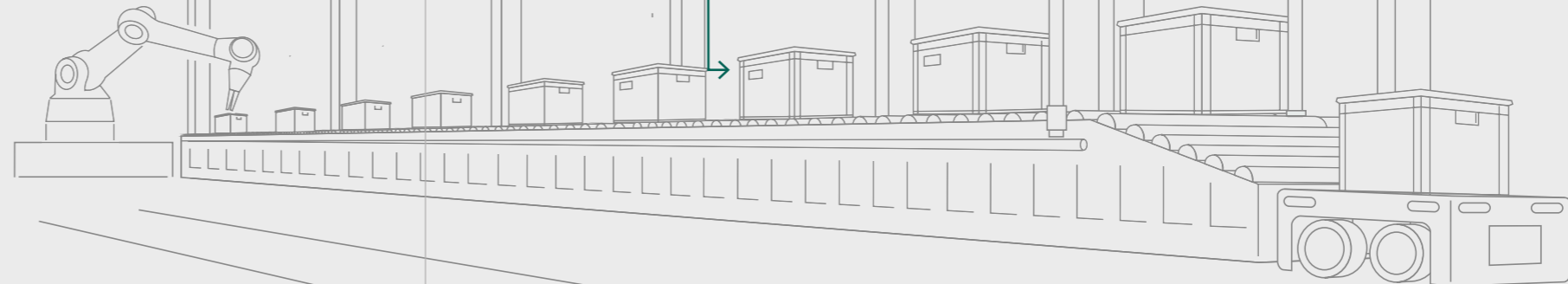


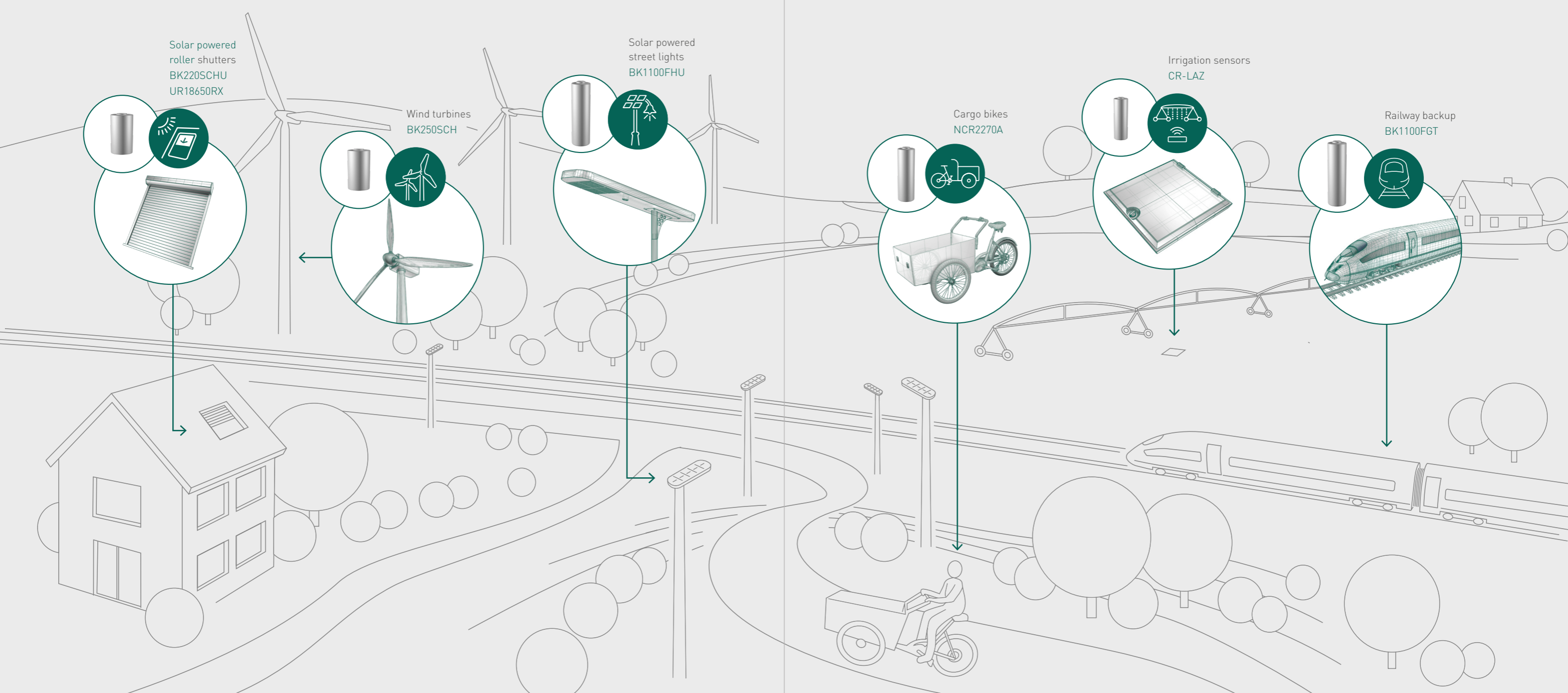
Gateways  
CR-LAZ



WH 4

AL 12





## INDUSTRY APPLICATION GREEN



More and more applications in our environment require autonomous and stable power supply. Saving resources and using renewable energy such as wind or sun energy is key for sustainable industries and agriculture. Panasonic offers a comprehensive product range to energize these applications. For more insights, watch out our YouTube video on green applications.

### FEATURES

- | Excellent charge capabilities of Ni-MH chemistry in combination with solar panels
- | Maintenance free solution for rural areas
- | Minimization of total cost of ownership by reliable battery solution
- | Customized Lithium-ion battery packs based on your demand

### OUR RECOMMENDATION





# Ni-MH

IDEAL FOR PROFESSIONAL APPLICATIONS IN CHALLENGING ENVIRONMENTS

- | Suitable for nearly every application
- | High quality and reliability
- | Good balance in terms of capacity and lifetime
- | Superior safety
- | Excellent discharge characteristics



## YOUR INFORMATION

Visit our product page and get detailed information about Ni-MH batteries.

## ABOUT OUR Ni-MH PRODUCTS

These very tough Ni-MH batteries offer a very long service life when using intermittent charging in high ambient temperature conditions (<math>\leq 75^{\circ}\text{C}</math> for certain types). Moreover, these batteries are ideal as a replacement for standard Ni-Cd batteries. They are

recommended for use in applications such as emergency lighting, servers, elevators, automated teller machines (ATMs), solar powered devices and as a back-up for base stations.

 <b>BATTERY SAFETY</b> <small>IEC 62133-1</small>	<b>BATTERY SIZE</b> <b>AAA</b> <b>RF</b>	 <b>ECO FRIENDLY</b> <small>NO TOXIC MATERIALS</small>	<b>7</b> <b>BATTERY SERIES</b>
 <b>TAYLOR-MADE PACKS</b>	<b>Ni-MH</b>		<small>ISO</small> <b>9001</b> <small>QUALITY</small>
<del><b>Ni-Cd</b></del> <small>REPLACED BY Ni-MH</small>	<b>12</b> <small>PRODUCED BATTERIES</small> <b>BILLION</b>	<small>ISO</small> <b>14001</b> <small>ENVIRONMENT</small>	 <b>MODULES &amp; SYSTEMS</b>
 <small>PRODUCTION SINCE</small> <b>1989</b>	<b>EASY</b>  <small>TRANSPORTATION BY AIR</small> <small>NO DANGEROUS GOODS</small>	<b>-40</b> <small>UP TO</small> <b>+105°C</b> <small>WIDE TEMPERATURE RANGE</small> <small>(DEPENDING ON CELL MODEL)</small>	

## STANDARD TYPE (N)

Ni-MH battery technology is nowadays the Ni-Cd (Nickel-Cadmium) successor technology for rechargeable and portable devices. These batteries are ideal for less complex and cost sensitive applications. For example medical equipment and handheld devices.

### FEATURES

- High versatility for various applications
- Good balance in terms of capacity and lifetime
- Various sizes for wide range of applications

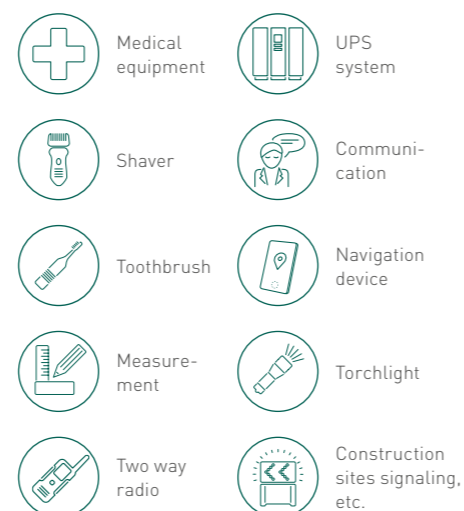
### MODEL NUMBER (EXAMPLE)

Nickel-Metal Hydride battery  
 Multiplied by 10 = rated capacity (some exceptions)  
 Diameter AAA, AA, A

BK 70 AA

MODEL NUMBER	Size	Nominal voltage [V]	Discharge capacity (mAh)		Diameter (mm)	Total height (mm)	Weight (g)	Charging temperature [°C]	Discharging temperature [°C]
			Rated	Average					
BK70AAAJ	AAA	1.2	700	730	10.5 +0/-0.7	44.5 +0/-1.5	12	0 to +45	-10 to +65
BK70AA	AA	1.2	700	780	14.5 +0/-0.7	49.0 +0/-1.5	18	0 to +45	-10 to +65
BK110AAP	AA	1.2	1,100	1,180	14.5 +0/-0.7	50.5 +0/-1.5	23	0 to +45	-10 to +65
BK150AA	AA	1.2	1,500	1,580	14.5 +0/-0.7	50.5 +0/-1.5	26	0 to +45	-10 to +65
BK200AAP	AA	1.2	1,900	1,980	14.5 +0/-0.7	50.5 +0/-1.5	27	0 to +45	-10 to +65
BK200A	4/5A	1.2	2,000	2,040	17.0 +0/-0.7	43.0 +0/-1.5	32	0 to +45	-10 to +65
BK210A	A	1.2	2,100	2,200	17.0 +0/-0.7	50.0 +0/-2.0	37	0 to +45	-10 to +65
BK250A	A	1.2	2,450	2,600	17.0 +0/-0.7	50.0 +0/-2.0	37	0 to +45	-30 to +65
BK380A	LA	1.2	3,700	3,800	17.0 +0/-0.7	67.0 +0/-2.0	53	0 to +45	-10 to +65
BK450A	LFat/A	1.2	4,200	4,500	18.2 +0/-0.7	67.5 +0/-1.5	60	0 to +45	-10 to +65

### APPLICATIONS



## BUTTON TOP TYPE (B)

The Panasonic button top type batteries are compatible with dry batteries such as Alkaline and can be used up to 1,800 times based on IEC<sup>\*1</sup> standards. They provide a high capacity level and a low self-discharge.

### FEATURES

- Offers long charge / discharge cycle life, about 1,800 times
- Low self-discharge and long storage life (still have 90% capacity after storage for 1 year)
- Compatibility with Alkaline battery

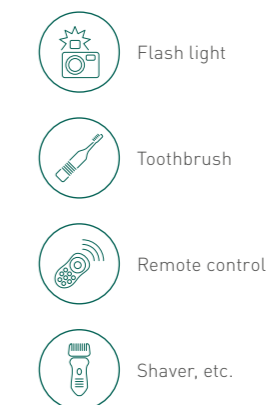
### MODEL NUMBER (EXAMPLE)

Nickel-Metal Hydride battery  
 Multiplied by 10 = rated capacity (some exceptions)  
 Diameter AAA, AA  
 Cup shape: button top type

BK 80 AAA B

MODEL NUMBER	Size	Nominal voltage [V]	Discharge capacity (mAh)		Diameter (mm)	Total height (mm)	Weight (g)	Charging temperature [°C]	Discharging temperature [°C] <sup>*4</sup>
			Rated	Average					
BK80AAAB <sup>*2</sup>	AAA	1.2	750	780	10.5 +0/-0.7	44.5 +0/-1.0	12	0 to +45	-10 to +65
BK200AAB <sup>*3</sup>	AA	1.2	1,900	1,980	14.5 +0/-0.7	50.5 +0/-1.0	27	0 to +45	-10 to +65

### APPLICATIONS



<sup>\*1</sup> IEC: Standard 61951-2 (2017) / 7.5.1.2

<sup>\*2</sup> Compatible with consumer AAA size.

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

<sup>\*4</sup> Below -20°C discharging, the performance depends on the usage condition. Please consult with Panasonic Energy engineer.



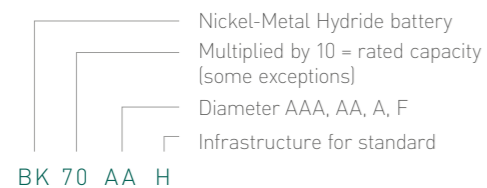
## INFRASTRUCTURE STANDARD TYPE (H)

The expected life of these back-up batteries is about 4 to 6 years and therefore approximately twice the lifetime compared to standard Ni-MH batteries. In addition they are capable of delivering excellent charge characteristics at high temperatures (60°C). Recommended applications are for example emergency lights, solar applications and back-up for base stations.

### FEATURES

- Enables use in wide range of temperatures (-10 to +60°C)
- Small size with long operational life (4-6 years)

### MODEL NUMBER (EXAMPLE)



### APPLICATIONS

- Medical equipment
- Emergency lighting
- POS system
- Solar window shutter
- Shaver
- Infusion pump, etc.

MODEL NUMBER	Size	Nominal voltage (V)	Discharge capacity (mAh)		Diameter (mm)	Total height (mm)	Weight (g)	Charging temperature (°C)	Discharging temperature (°C)
			Rated	Average					
BK70AAH	AA	1.2	700	750	14.5 +0/-0.7	49.0 +0/-1.5	18	-10 to +60	-10 to +60
BK110AAH	AA	1.2	1,100	1,180	14.5 +0/-0.7	50.5 +0/-1.5	24	-10 to +60	-10 to +60
BK150AAH	AA	1.2	1,450	1,530	14.5 +0/-0.7	50.5 +0/-1.5	25	-10 to +60	-10 to +60
BK160AH	4/5A	1.2	1,600	1,720	17.0 +0/-0.7	43.0 +0/-1.5	29	-10 to +60	-10 to +60
BK210AH	A	1.2	1,900	2,050	17.0 +0/-0.7	50.0 +0/-2.0	35	-10 to +60	-10 to +60
BK370AH	LFat/A	1.2	3,500	3,700	18.2 +0/-0.7	67.5 +0/-1.5	60	-10 to +60	-10 to +60

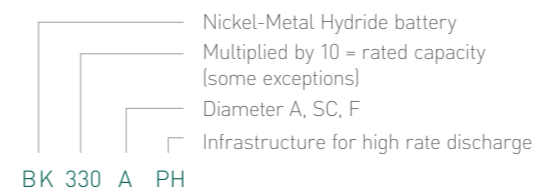
## INFRASTRUCTURE HIGH RATE DISCHARGE TYPE (PH)

These state-of-the-art back-up batteries deliver excellent current discharge characteristics at high temperatures (60°C). They are able to power applications such as back-up for UPS, POS systems and solar window shutters.

### FEATURES

- Long operational life (4-6 years)
- High rate discharge (5lt discharge at 20°C) available

### MODEL NUMBER (EXAMPLE)



### APPLICATIONS

- Medical equipment
- UPS system
- Garden tool
- POS system
- Robot cleaner
- Solar window shutter, etc.
- Electric vehicle

MODEL NUMBER	Size	Nominal voltage (V)	Discharge capacity (mAh)		Diameter (mm)	Total height (mm)	Weight (g)	Charging temperature (°C)	Discharging temperature (°C)
			Rated	Average					
BK250SCH	SC	1.2	2,500	2,650	23.0 +0/-1.0	43.0 +0/-1.5	53	-10 to +60	-10 to +60
BK330APH	LFat/A	1.2	3,200	3,300	18.2 +0/-0.7	67.5 +0/-1.5	59	-10 to +60	-10 to +60
BK850FPH	F	1.2	8,500	8,950	33 +0/-1.0	91.0 +0/-2.5	220	-20 to +75	-20 to +85

WE POWER YOUR  
SAFETY



WE POWER YOUR  
MACHINES

## HIGH RATE DISCHARGE TYPE (P)

These battery types provide excellent current discharge characteristics and are designed for rapid charging. They are most suitable for power tools, robot cleaners and other high power high cycle applications.

### FEATURES

- Excellent large current discharge characteristics
- Rapid charge-capable

### MODEL NUMBER (EXAMPLE)

Nickel-Metal Hydride battery  
 Multiplied by 10 = rated capacity (some exceptions)  
 Diameter SC  
 High rate discharge & rapid charge type

### APPLICATIONS

- Medical equipment
- Garden tool
- Robot cleaner
- Electric vehicle
- Power tool
- Operating table, etc.

MODEL NUMBER	Size	Nominal voltage (V)	Discharge capacity (mAh)		Diameter (mm)	Total height (mm)	Weight (g)	Charging temperature (°C)	Discharging temperature (°C)
			Rated	Average					
BK260SCP*1	SC	1.2	2,450	2,700	23.0 +0/-1.0	43.0 +0/-1.5	55	0 to +45	-10 to +65
BK300SCP*1	SC	1.2	2,800	3,050	23.0 +0/-1.0	43.0 +0/-1.5	57	0 to +45	-10 to +65

## INFRASTRUCTURE LONG LIFE TYPE (U)

These very tough Ni-MH batteries offer a very long service life when using intermittent charging at high ambient temperature conditions. Moreover, these batteries are ideal as a replacement for standard Ni-Cd batteries. They are recommended for use in applications such as emergency lighting, servers, elevators, automated teller machines (ATM), solar powered devices and as a back-up for base stations. For more insights, watch our special YouTube video on Nickel-Metal-Hydrate U-type batteries.

### FEATURES

- Expected lifetime is about 8 to 10 years
- Superior charge efficiency under high temperature conditions
- Available in various sizes
- Very long service life when using intermittent charging at high ambient temperature conditions
- Excellent low self-discharge characteristics

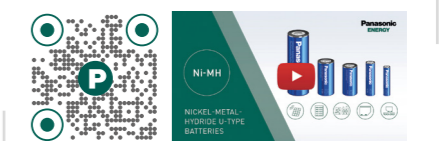
### MODEL NUMBER (EXAMPLE)

Nickel-Metal Hydride battery  
 Multiplied by 10 = rated capacity (some exceptions)  
 Diameter AAA, AA, C, F, SC  
 High temperature & long life type  
 Infrastructure for long life

MODEL NUMBER	Size	Nominal voltage (V)	Discharge capacity (mAh)		Diameter (mm)	Total height (mm)	Weight (g)	Charging temperature (°C)	Discharging temperature (°C)
			Rated	Average					
BK60AAAHU	AAA	1.2	500	550	10.5 +0/-0.7	44.5 +0/-1.5	12	-10 to +75	-20 to +75
BK120AAHU	AA	1.2	1,200	1,280	14.5 +0/-0.7	50.5 +0/-1.5	24	-20 to +75	-20 to +75

### APPLICATIONS

- Solar powered application
- Server
- UPS system
- Elevator
- Emergency light
- Active cooling and tracking for airfreight
- Industrial trucks robots, etc.



\*1 For high power use application such as power tools.

MODEL NUMBER	Size	Nominal voltage (V)	Discharge capacity (mAh)		Diameter (mm)	Total height (mm)	Weight (g)	Charging temperature (°C)	Discharging temperature (°C)
			Rated	Average					
BK220SCHU	SC	1.2	2,200	2,300	23.0 +0/-1.0	43.0 +0/-1.5	52	-20 to +75	-20 to +75
BK310CHU	C	1.2	3,100	3,300	25.8 +0/-1.0	50.0 +0/-2.0	78	-20 to +75	-20 to +75
BK1100FHU	F	1.2	11,000	12,000	33.0 +0/-1.0	91.0 +0/-2.5	245	-20 to +75	-20 to +85
BK1100FGT	F	1.2	11,000	12,000	33.0 +0/-1.0	91.0 +0/-2.5	245	-20 to +75	-40 to +75

## BACKUP FOR AUTOMOTIVE TYPE (W)

This new Panasonic Ni-MH battery series is particularly designed for E-call systems. The long life reliability and the high discharge capability make these batteries ideal for these demanding applications. Also, our new batteries are eco-friendly designed and non-flammable.

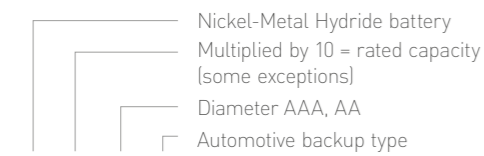
### FEATURES

- Excellent low temperature discharge performance
- Provides high safety battery pack
- Complies with automotive standard production (IATF, VDA6.3)

### APPLICATIONS

- E-call
- ADAS back-up
- Low temperature data logger
- Car alarm

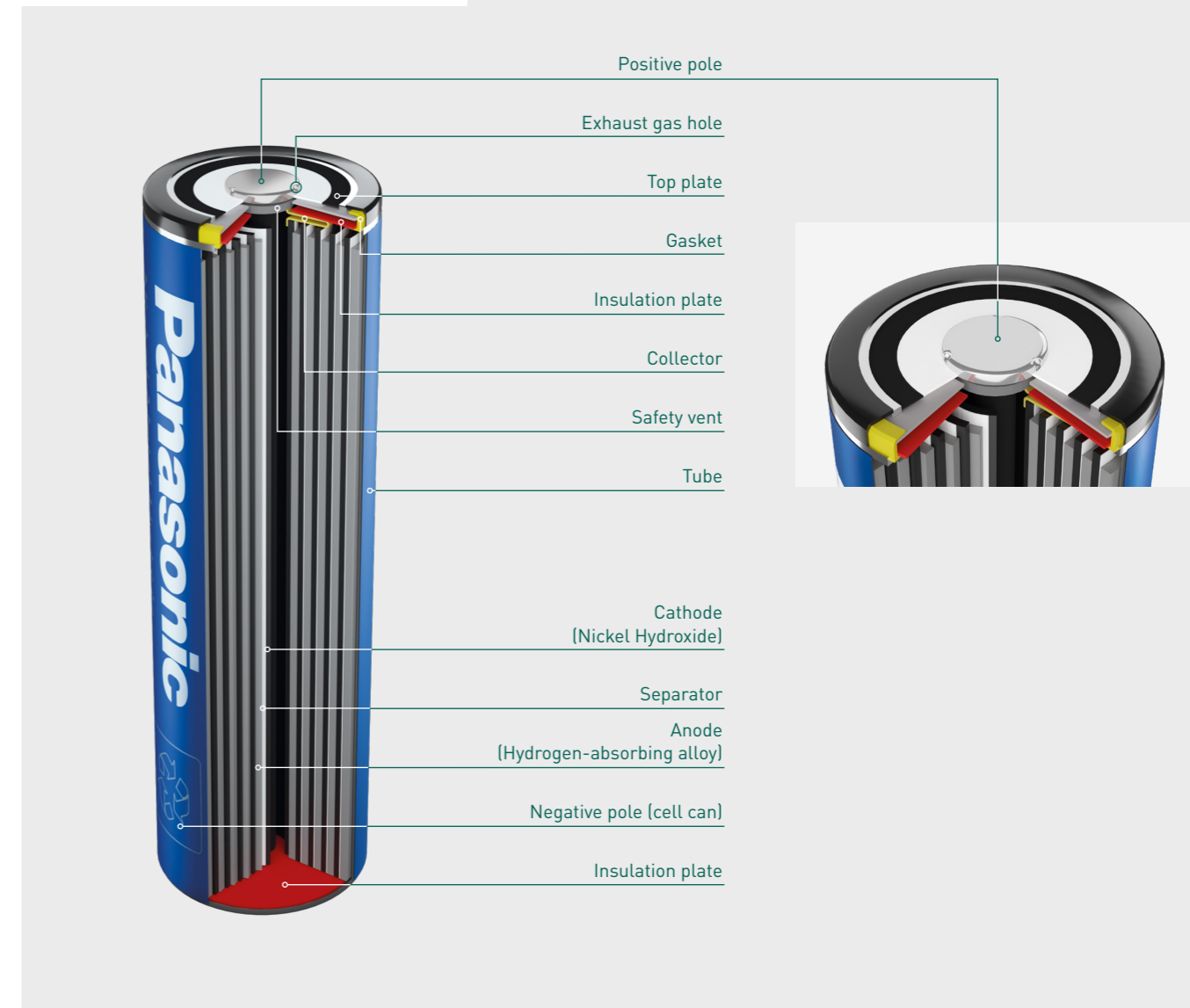
### MODEL NUMBER (EXAMPLE)



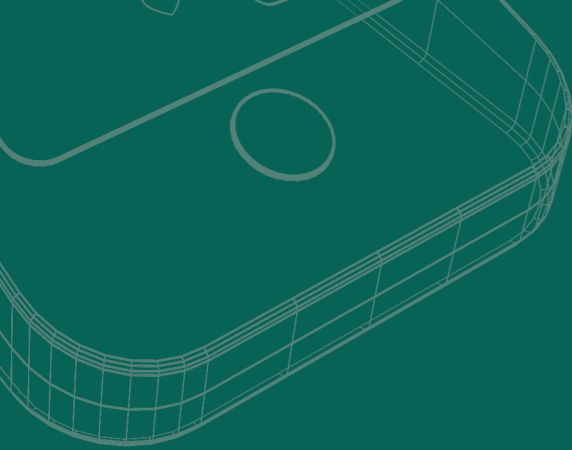
BK 60 AAA WS

MODEL NUMBER	Size	Nominal voltage (V)	Discharge capacity (mAh)		Diameter (mm)	Total height (mm)	Weight (g)	Charging temperature (°C)	Discharging temperature (°C)
			Rated	Average					
BK60AAAWS	AAA	1.2	500	550	10.5 +0/-0.7	44.5 +0/-1.5	11	-20 to +60	-30 to +85
BK120AAWS	AA	1.2	1,100	1,180	14.5 +0/-0.7	50.5 +0/-1.5	24	-20 to +60	-40 to +85
BK120AAWX	AA	1.2	1,100	1,180	14.5 +0/-0.7	50.5 +0/-1.5	24	-20 to +70	-40 to +105

## BATTERY INSIDE\*1



\*1 The illustration shows only one example of Ni-MH battery structure.



# LITHIUM-ION

## EXCELLENT BATTERY SAFETY AND SUPERIOR PERFORMANCE

- | Stable power supply with high voltage discharge
- | Excellent reliability
- | Low self-discharge
- | High energy density



### YOUR INFORMATION

Visit our product page and get detailed information about Lithium-ion batteries.

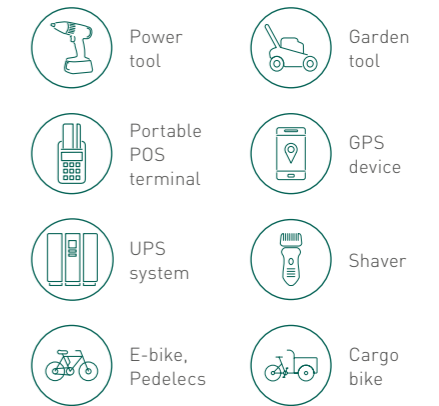
## CYLINDRICAL SINGLE CELL

A perfect combination of high energy density (NNP technology), safety and long-life shows what is possible with Lithium-ion battery technology from Panasonic. Excellent battery safety on one hand, and superior battery performance on the other: this is what Panasonic stands for.

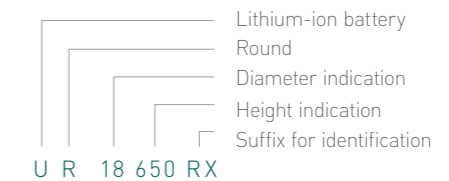
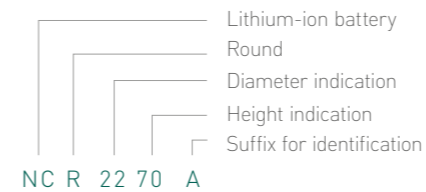
### FEATURES

- | High energy density and high voltage ensure small battery dimensions
- | Long-life, stable power supply with high voltage discharge
- | Use of Lithium-ion batteries requires a safety unit
- | Safety technologies such as HRL available

### APPLICATIONS







### MODEL NUMBER (EXAMPLE)

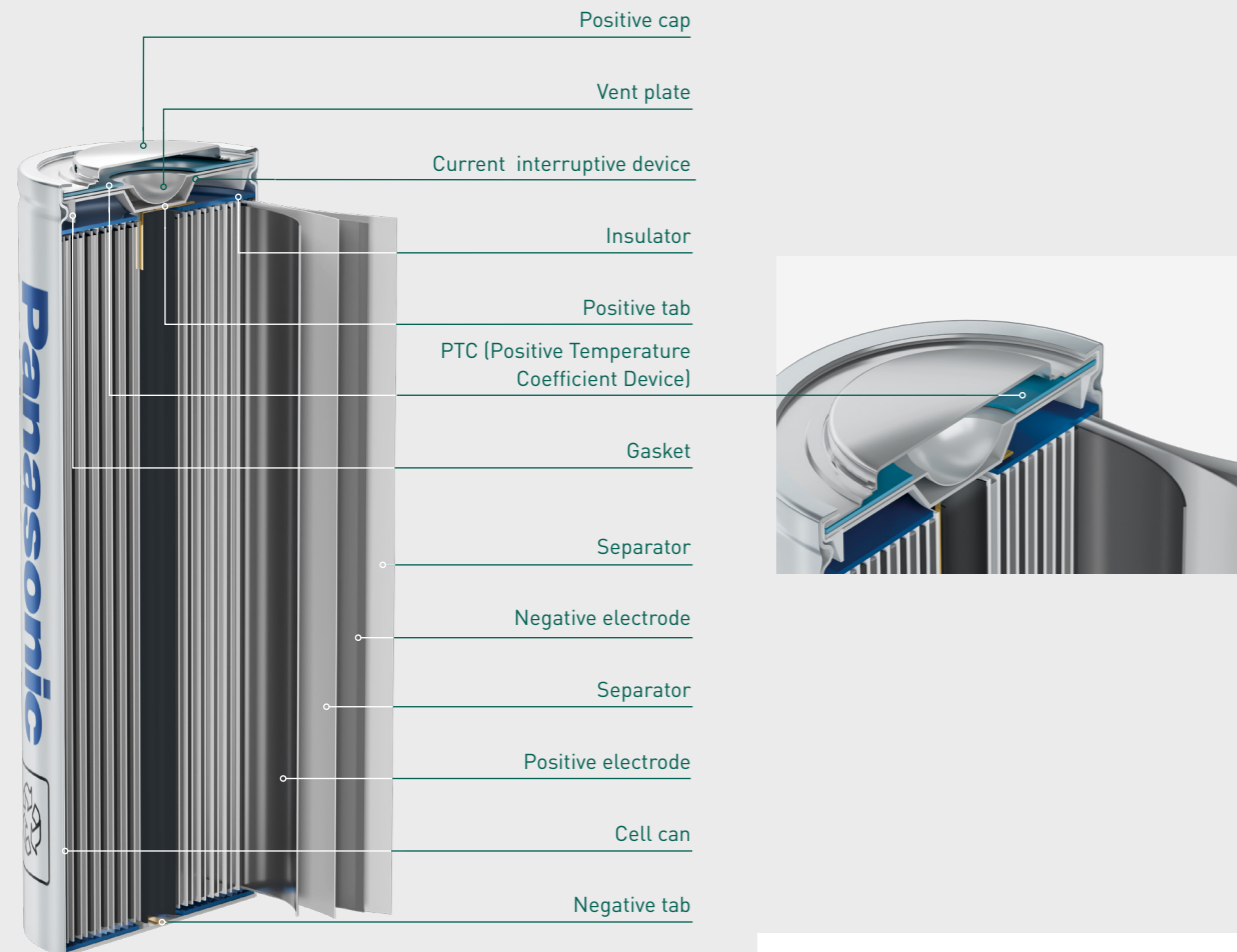


MODEL NUMBER	Type	Nominal voltage (V)	Typical*1 capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)
UR14500AC	Cylindrical/Standard	3.6	800	14.30	49.50	19.6
UR18650A	Cylindrical/Standard	3.6	2,250	18.50	65.10	44.0
UR18650AA	Cylindrical/Standard	3.6	2,250	18.50	65.10	43.1
UR1865ZM2	Cylindrical/Standard	3.6	2,550	18.50	65.30	46.4
UR1865ZP	Cylindrical/Standard	3.6	2,600	18.50	65.30	46.9

\*Without tube

\*1 4.20V charge  
 \*2 NNP - Nickel Oxide Based New Platform  
 \*3 HRL - Heat Resistance Layer

MODEL NUMBER	Type	Nominal voltage (V)	Typical <sup>*1</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)
UR18650RX	 Cylindrical/High Rate Discharge	3.6	2,050	18.50	65.30	47.5
NCR1865K	 Cylindrical/High Rate Discharge	3.6	3,100	18.50	65.30	47.5
NCR2270A	 Cylindrical/High Capacity (Middle Rate Discharge)	3.6	5,635	21.80*	70.90*	74.5*
NCR2270B	 Cylindrical/High Capacity (Middle Rate Discharge)	3.6	6,000	21.80*	70.90*	75.0*



### BATTERY INSIDE<sup>\*2</sup>

<sup>\*1</sup> 4.20V charge  
<sup>\*2</sup> Some batteries are not equipped with a PTC. Please consult Panasonic for further information. The illustration shows only one example of a Lithium-ion battery structure.

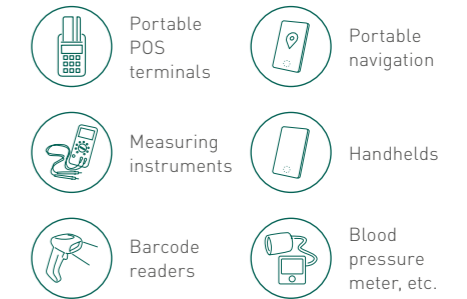
## PRISMATIC SINGLE CELL

A perfect combination of high energy density (NNP technology), safety and long-life shows what is possible with Lithium-ion battery technology from Panasonic. Excellent battery safety on one hand, and superior battery performance on the other: this is what Panasonic stands for.

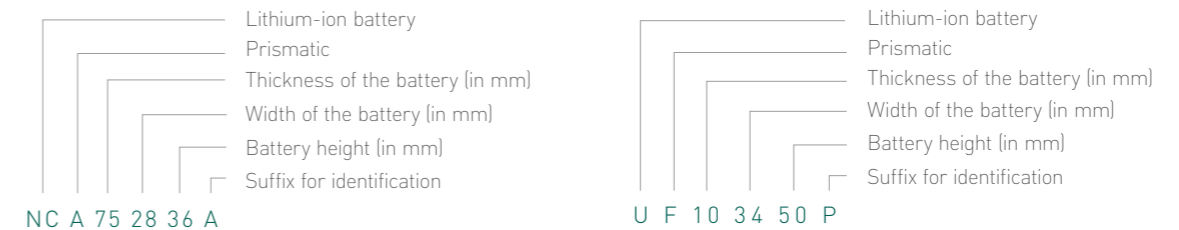
### FEATURES










- High energy density and high voltage ensure small battery dimensions
- Long-life, stable power supply with high voltage discharge
- Use of Lithium-ion batteries requires a safety unit
- Safety technologies such as HRL available

### APPLICATIONS



### MODEL NUMBER (EXAMPLE)



MODEL NUMBER	Type	Nominal voltage (V)	Typical <sup>*1</sup> capacity (mAh)	Width (mm)	Thickness (mm)	Total height (mm)	Weight (g)
CGA103450A	 Prismatic/Standard	3.7	1,950	33.80	10.50	48.75*	39.2
CGA573442	 Prismatic/Standard	3.7	960	33.80	5.60	41.80*	18.5
UF103450PN	 Prismatic/Standard	3.7	2,000	33.80	10.50	48.80	38.5
UF463443GUM	 Prismatic/Standard	3.7	850	33.85	4.55	42.60	16.0
UF463450FP	 Prismatic/Standard	3.7	960	33.85	4.45	49.60	18.5
UF553443ZU	 Prismatic/Standard	3.7	1,040	33.80	5.55	42.80	18.7
UF553450ZPC	 Prismatic/Standard	3.7	1,200	33.85	5.55	49.80	22.30
UF653450SQ	 Prismatic/Standard	3.7	1,300	33.85	6.35	49.80	25.1
UF703450F	 Prismatic/Standard	3.7	1,480	33.85	7.0	49.80	28.1

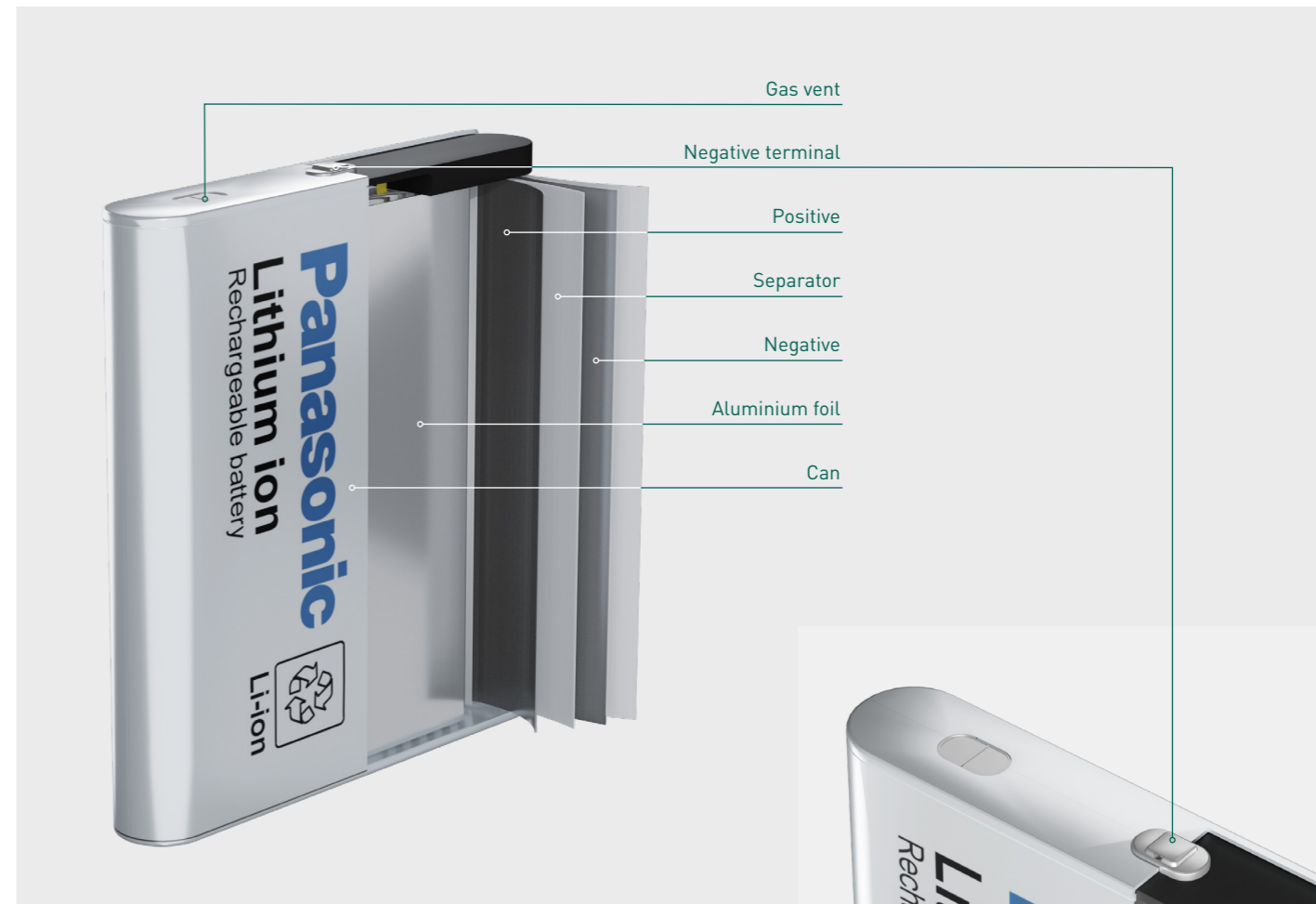
<sup>\*1</sup> 4.20V charge  
<sup>\*2</sup> NNP - Nickel Oxide Based New Platform  
<sup>\*3</sup> HRL - Heat Resistance Layer

\*With bottom lead plate

MODEL NUMBER	Type	Nominal voltage (V)	Typical <sup>1)</sup> capacity (mAh)	Width (mm)	Thickness (mm)	Total height (mm)	Weight (g)
CGA463443XA	Prismatic/High Voltage	3.8	910	33.80	4.60	42.70*	15.5
CGA463450XA	Prismatic/High Voltage	3.8	1,030	33.80	4.55	49.70*	17.6
CGA553450XA	Prismatic/High Voltage	3.8	1,310	33.80	5.70	49.90*	21.5
NCA103443	Prismatic/High Capacity	3.6	2,010	33.80	10.50	42.70*	33.4
NCA103450	Prismatic/High Capacity	3.6	2,350	33.80	10.50	48.75*	38.3
NCA463436A	Prismatic/High Capacity	3.6	720	34.30	4.60	35.75*	12.4
NCA523436	Prismatic/High Capacity	3.6	840	34.30	5.15	35.50	14.1
NCA593142SA	Prismatic/High Capacity	3.6	1,110	30.95	5.90	42.25	17.7
NCA622944SA	Prismatic/High Capacity	3.6	1,170	28.70	6.25	44.70*	18.1
NCA623535	Prismatic/High Capacity	3.6	1,100	35.20	6.30	35.35*	17.6
NCA653864SA	Prismatic/High Capacity	3.6	2,400	38.10	6.50	64.60*	37.0
NCA673440	Prismatic/High Capacity	3.6	1,265	33.80	6.75	40.35*	20.3
NCA752836A	Prismatic/High Capacity	3.6	1,010	27.90	7.80	35.95*	16.7
NCA793540	Prismatic/High Capacity	3.6	1,570	35.10	7.95	40.50*	24.7
NCA882936SA	Prismatic/High Capacity	3.6	1,310	28.70	8.80	36.55*	20.1
NCA903864A	Prismatic/High Capacity	3.6	3,280	38.0	9.0	64.05*	50.7

\*With bottom lead plate

<sup>1)</sup> 4.20V charge  
<sup>2)</sup> NNP - Nickel Oxide Based New Platform  
<sup>3)</sup> HRL - Heat Resistance Layer  
<sup>4)</sup> LCO system - This Panasonic system uses a Cobalt-based cathode and offers high capacity. Some batteries are not equipped with a PTC. Please consult Panasonic for further information.



BATTERY INSIDE\*<sup>1)</sup>

## NOTICE TO READERS

We are unable to support single cell business or accept orders from consumers. We design Lithium-ion battery packs including a suitable safety unit device based on the technical specification of the customer. Due to the need for careful review when selecting Lithium-ion battery solutions, please contact your local Panasonic sales office. In order to avoid a lack of supply please check the battery availability with your Panasonic sales team before design-in.



<sup>1)</sup> The illustration shows only one example of a Lithium-ion battery structure.  
<sup>2)</sup> 4.20V charge  
<sup>3)</sup> LCO system - This Panasonic system uses a Cobalt-based cathode and offers high capacity. Some batteries are not equipped with a PTC. Please consult Panasonic for further information.

# POUCH TYPE LITHIUM-ION BATTERIES / HIGH VOLTAGE

The highly balanced combination of high energy density, safety, and long life demonstrates the potential of Panasonic's Lithium-ion battery technology. On the one hand, we pursue outstanding safety; on the other, we achieve exceptional performance - this is the commitment that defines Panasonic.

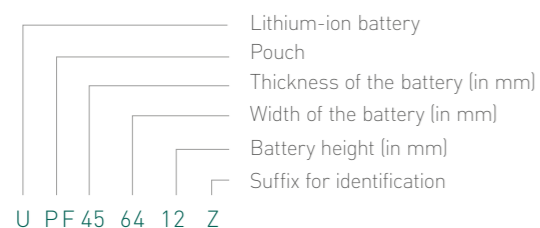
Pouch type Lithium-ion batteries use a thin and lightweight aluminum laminate film as the exterior casing, achieving both a slim profile and high capacity. Additionally, these batteries are lightweight and offer greater flexibility in shape, making them suitable for a wide range of device functionality and design requirements.



An ideal battery for electronic devices that require high voltage. The high-voltage type supports higher operating voltages, contributing to improved overall system efficiency. It is especially suitable for devices that demand a slim and lightweight design.

## FEATURES







- | Achieving both a slim design and high capacity
- | Long operating time
- | Lightweight design and flexible form factor

## MODEL NUMBER (EXAMPLE)



MODEL NUMBER	Type	Nominal voltage [V]	Typical*1 capacity [mAh]	Width [mm]	Thickness [mm]	Total height [mm]	Weight [g]
UPF488270Z	 Pouch/High Voltage	3.85	4,600	81.30	4.80	69.50	61.4
UPF4564124Z	 Pouch/High Voltage	3.85	6,000	63.60	4.50	123.20	81.1

## APPLICATIONS

-  CCTV camera
-  Note PC
-  Tablet PC
-  Handy terminal
-  Game
-  AED / Defibrillator



BATTERY INSIDE\*1



\*1 The illustration shows only one example of a Lithium-ion battery structure.

# LITHIUM

## STATE-OF-THE-ART LITHIUM BATTERIES

- | Low self-discharge
- | Decades of mass production experience
- | Superior designed battery ranges
- | Proven reliability



### YOUR INFORMATION

Visit our product page and get detailed information about Lithium-ion batteries.

## ABOUT OUR LITHIUM PRODUCTS

Today, Panasonic's Lithium battery technologies are becoming more and more important. Due to their superior quality and performance characteristics these batteries are able to power a broad range of applications.

Find out why Panasonic is especially emphasizing its famous BR and CR technologies which have set the standard for outstanding quality in the market for many years.

<p>UP TO <b>+125°C</b> WIDE TEMPERATURE RANGE <small>(DEPENDING ON CELL MODEL)</small></p>	<p><b>6</b> DIFFERENT SUB CHEMIS-TRIES</p>	<p><b>ECO</b> FRIENDLY <small>NO TOXIC MATERIALS</small></p>	<p><b>4</b> FACTORIES TO SUPPORT GLOBAL DEMAND</p>
<p><b>TAYLOR-MADE PACKS &amp; TERMINALS</b></p>	<p><b>LITHIUM</b></p>		<p>ISO <b>9001</b> QUALITY</p>
<p><b>IATF</b> 16949-2016 AUTOMOTIVE</p>	<p><b>NO</b> PASSIVATION</p>	<p>BATTERY <b>SAFETY</b> <small>IEC 62133-1 IEC 60086-4</small></p>	<p><b>&gt; 20</b> YEARS LONG LIFE <small>(DEPENDING ON USAGE CONDITIONS)</small></p>
<p><b>SINCE 1971</b> PRODUCTION</p>	<p><b>&gt; 50</b> YEARS EXPERIENCE</p>	<p><b>NO</b> TOXIC MATERIALS</p>	<p>ISO <b>14001</b> ENVIRONMENT</p>

## BR AND CR PRIMARY

These days Lithium battery technologies are getting more and more important. Due to their high voltage, low self-discharge and proven reliability a broad range of applications can be powered. In particular the BR, CR and ER battery technologies are leading the indus-

tries. Please study the comparison overview below and find out why Panasonic is especially emphasizing on its famous BR and CR technology which is a proof for outstanding quality for years in the market.

CHEMISTRY COMPARISON*1		BR	CR	ER	
MATERIAL	Cathode	CF	MnO <sub>2</sub>	SOCl <sub>2</sub>	
	Anode	LITHIUM METAL			
	Electrolyte	ORGANIC ELECTROLYTE			
PERFORMANCE	Nominal voltage	3V	3V	3.6V	
	Voltage during discharge (Initial)	LOW CURRENT	++	++	+
		HIGH CURRENT	+	++	-
	Voltage during discharge (End of capacity)	LOW CURRENT	++	++	++
		HIGH CURRENT	+	++	-
	Available capacity retention at any cell orientation	++	++	- <sup>2</sup>	
	Pulse performance at low temperature	INITIAL	+	++	-
		END OF LIFE	+	++	-
	Storage performance	++	+	- <sup>3</sup>	
	Reliability	++	+	- <sup>3</sup>	
Safety	++	++	-		
ENVIRONMENT	Eco friendly	++	++	- <sup>3</sup>	

++ Very good applicability  
+ Good applicability  
- Not good applicability

\*1 Please contact Panasonic to get more detailed information about this technical comparison overview.

\*2 In case Bobbin type

\*3 Impedance increasing due to the passivation phenomena.

\*3 Harmful substances included.

## BR LITHIUM CYLINDRICAL SERIES (NON-RECHARGEABLE)

Our Panasonic Poly-Carbonmonofluoride Lithium batteries (BR series) are ideal for applications such as meters or smoke detectors which demand either long-term power supply reliability or need to handle a wide temperature range.

### FEATURES

- Operating temperature range: between -40°C ~ +85°C
- Low self discharge rate
- Superior long-term reliability
- 40+ years of experience in production

### MODEL NUMBER (EXAMPLE)

B R 1/2 AA

### APPLICATIONS

- Heat cost allocators
- Car alarm
- Tracking & RFID
- Marine devices
- Water meters
- Gas meters
- Smoke detectors



WE POWER YOUR  
METERING

## CR LITHIUM CYLINDRICAL SERIES (NON-RECHARGEABLE)

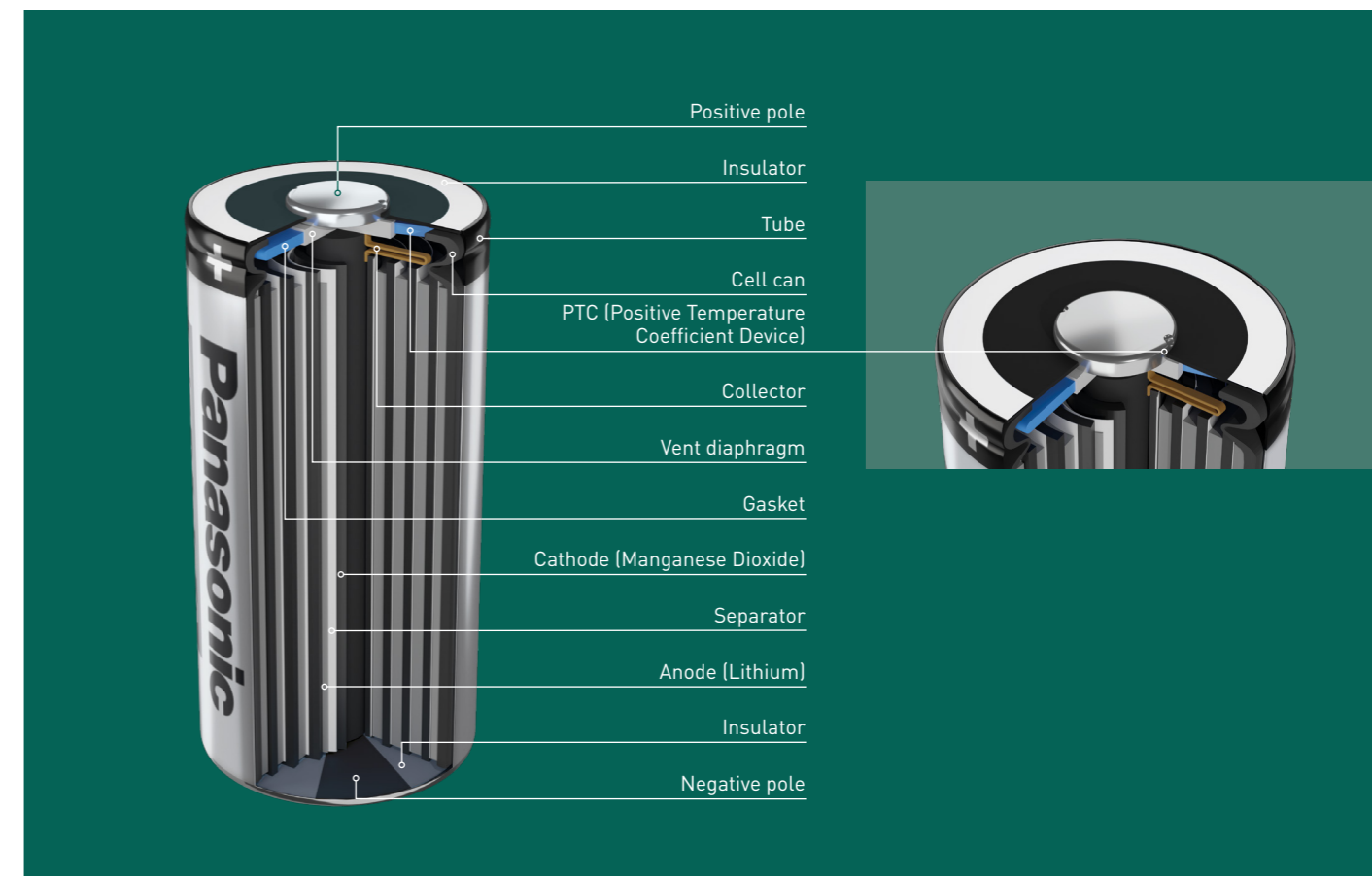
Panasonic Lithium CR type cylindrical batteries come as either single cells or dual cell packs. All cylindrical type Manganese Dioxide (CR series) Lithium batteries feature a spiral structure. With their enlarged electrode surface areas, they permit a current as high as several amperes to be drawn. In addition these batteries are convenient for equipments which are considered to replace the battery at the field.

### APPLICATIONS



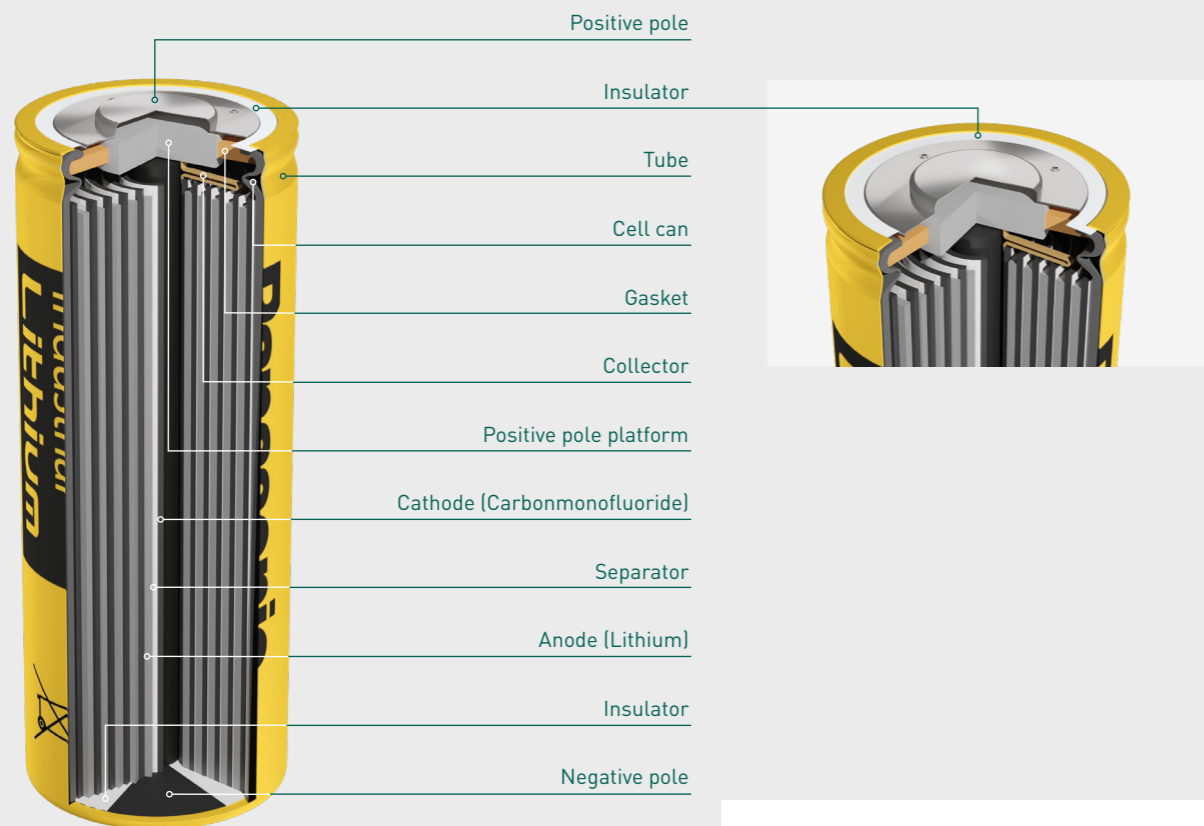
### FEATURES

- | Operating temperature range: between -40°C ~ +70°C<sup>\*1</sup>
- | Good pulse discharge capability
- | Stable operation voltage
- | Low self discharge rate



### BATTERY INSIDE<sup>\*2</sup>

<sup>\*1</sup> Please consult your Panasonic sales representative when anticipating usage in operation temperature is between -40°C to -20°C.  
<sup>\*2</sup> The illustration shows only one example of Lithium battery structure.

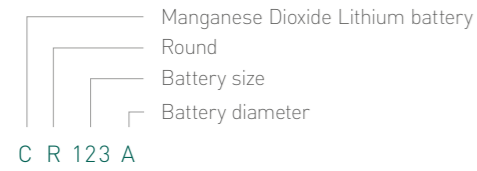


### BATTERY INSIDE<sup>\*1</sup>

MODEL NUMBER	Nominal voltage (V)	Nominal <sup>*2</sup> capacity (mAh)	Size	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
BR-1/2AA <sup>*3*</sup>	3	1,000	1/2 AA	14.5	25.5	8	-40 to +100
BR-2/3A <sup>*4</sup>	3	1,200	2/3 A 17355	17.0	33.5	13	-40 to +85
BR-2/3AG <sup>*4</sup>	3	1,450	2/3 A 17355	17.0	33.5	13	-40 to +85
BR-A <sup>*4</sup>	3	1,800	A	17.0	45.5	18	-40 to +85
BR-AG <sup>*4</sup>	3	2,200	A	17.0	45.5	18	-40 to +85
BR-C <sup>*4</sup>	3	5,000	C	26.0	50.5	41	-40 to +85

<sup>\*1</sup> The illustration shows only one example of Lithium battery structure.  
<sup>\*2</sup> Capacity based on standard drain and cut off voltage down to 2.0V at 20°C.  
<sup>\*3</sup> Operating temperature range is from -40°C ~ +100°C.  
<sup>\*4</sup> Cells are supplied with tabs or lead-wires only. For available configurations please consult the Panasonic homepage or your sales contact.

### MODEL NUMBER (EXAMPLE)



MODEL NUMBER	Nominal voltage (V)	Nominal <sup>*1</sup> capacity (mAh)	Size	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
CR2 <sup>*2</sup>	3	850	15270	15.6	27.0	11	-40 to +70
CR123A <sup>*2</sup>	3	1,550	17345	17.0	34.5	16	-40 to +70
CR123AV <sup>*3</sup>	3	1,550	17345	17.0	34.5	16	-40 to +70
2CR5 <sup>*2</sup>	6	1,550	-	34.0 x 17.0	45.0	38	-40 to +70
CR-P2 <sup>*2</sup>	6	1,550	-	35.0 x 19.5	36.0	37	-40 to +70

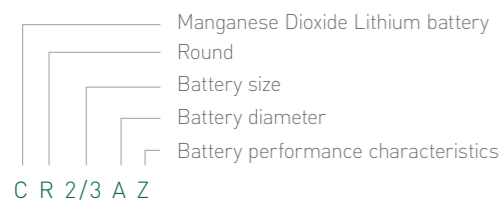
## CR LITHIUM CYLINDRICAL SERIES FOR INDUSTRIAL (NON-RECHARGEABLE)

Ideal for industrial equipment, this series offers both excellent high-rate discharge performance and a service life of 15 years or more. For more insights, watch our special YouTube video on CR Lithium cylindrical series battery solution.

### FEATURES

- Stable impedance throughout battery life
- Operating temperature range: between -40°C ~ +85°C<sup>\*4</sup>
- Superior high drain discharge performance
- Long-term reliability
- Low self discharge rate

### MODEL NUMBER (EXAMPLE)



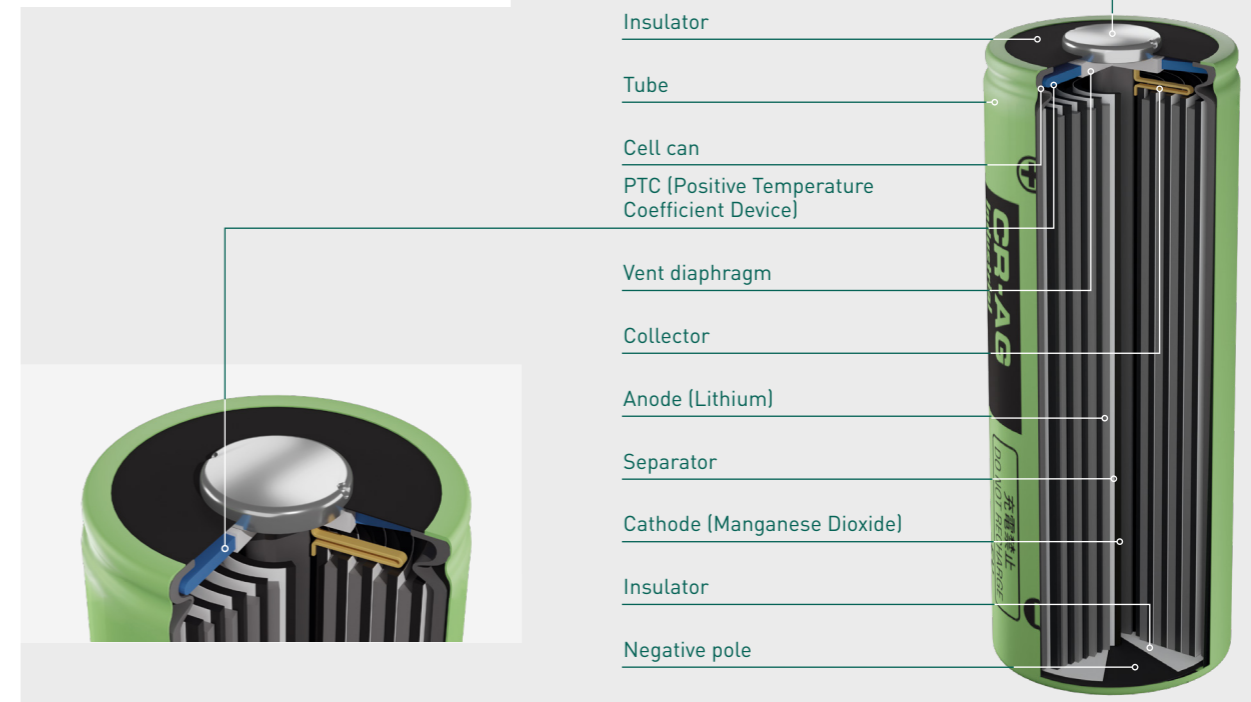
### APPLICATIONS

Smart meter	Automotive
Smoke detectors	Marine devices
Security devices and systems	Medical equipment
Irrigation sensor	Predictive maintenance
Security devices and systems	



MODEL NUMBER	Nominal voltage (V)	Nominal <sup>*1</sup> capacity (mAh)	Size	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
CR-AAU	3	1,800	AA 14500	14.5	50.5	18	-40 to +85
CR2Z	3	1,000	15270	15.6	27.0	11	-40 to +85
CR2U	3	1,000	15270	15.6	27.0	11	-40 to +85
CR-2/3AU	3	1,600	2/3A 17335	17.0	33.5	16	-40 to +85
CR-2/3AZ	3	1,600	2/3A 17335	17.0	33.5	16	-40 to +85
CR-AG	3	2,400	A	17.0	45.5	22	-40 to +85
CR-AGZ	3	2,700	A	17.0	45.5	23	-40 to +85
CR-LAZ	3	3,000	A	17.0	50.5	26	-40 to +85
CR-LAS	3	3,500	A	17.5	50.5	28	-40 to +85

### BATTERY INSIDE<sup>\*2</sup>



<sup>\*1</sup> Capacity based on standard drain and cut off voltage down to 2.0V or 4.0V at 20°C.  
<sup>\*2</sup> Please consult your Panasonic sales representative when anticipating usage in operation temperature is between -40°C to -20°C, or +60°C to +70°C.  
<sup>\*3</sup> Under development.  
<sup>\*4</sup> Please contact Panasonic when anticipating usage in operation temperature 70°C or above.  
<sup>\*5</sup> Reference design for descriptive purpose only

<sup>\*1</sup> Capacity based on standard drain and cut off voltage down to 2.0V at 20°C.  
<sup>\*2</sup> The illustration shows only one example of Lithium battery structure. Not applicable for CR-LAS

# BR LITHIUM COIN SERIES

(NON-RECHARGEABLE)

Panasonic Lithium BR coin type batteries feature high energy density, and were developed and commercialized using Panasonic's extensive experience in battery technology. They exhibit stable performance under high ambient temperatures.

## FEATURES

- Low self discharge rate
- Wide operating temperature range: between -30°C ~ +85°C
- Superior long-term reliability
- 44+ years of experience in production

## MODEL NUMBER (EXAMPLE)

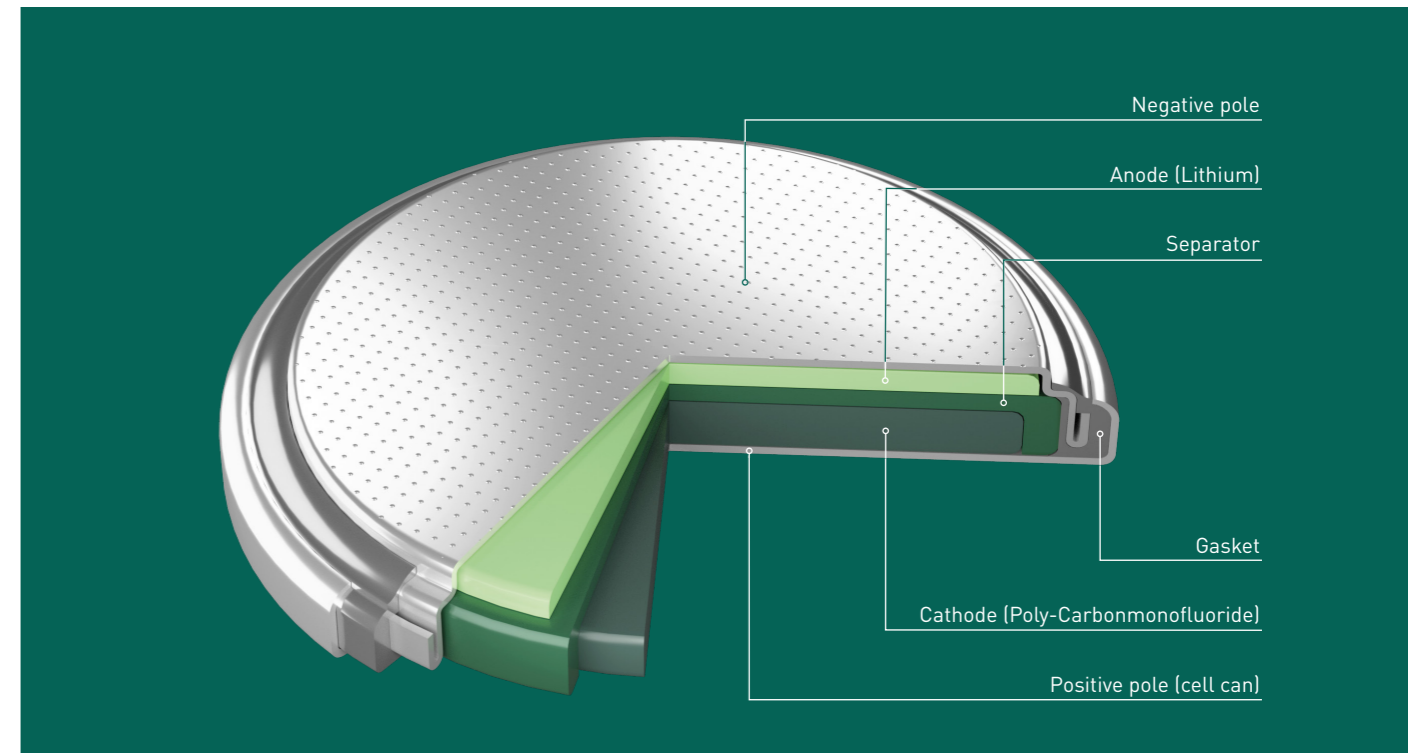
Poly-Carbonmonofluoride Lithium battery  
 Round  
 Battery diameter (in mm)  
 Divided by 10 = battery height (in mm)  
**B R 23 30**

## APPLICATIONS

- Tracking & RFID
- Real Time Clock (RTC)
- Memory back-up
- Meters, etc.

MODEL NUMBER	Nominal voltage (V)	Nominal <sup>*1</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
BR1220	3	35	12.5	2.0	0.7	-40 to +85
BR1225	3	48	12.5	2.5	0.8	-40 to +85
BR1632	3	120	16.0	3.2	1.5	-40 to +85
BR2032	3	200	20.0	3.2	2.6	-40 to +85
BR2325	3	165	23.0	2.5	3.0	-40 to +85
BR2330	3	255	23.0	3.0	3.2	-40 to +85
BR3032	3	500	30.0	3.2	5.7	-40 to +85

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



BATTERY INSIDE\*1



\*1 The illustration shows only one example of Lithium battery structure.




# BR-A LITHIUM COIN TYPE SERIES FOR HIGH TEMPERATURE USAGE (NON-RECHARGEABLE)

The high energy density and the special material for gasket and separator make this battery series the ideal power supply in high ambient temperature applications.


## FEATURES

- Superior design for high temperature applications (-40°C ~ +125°C)
- Outstanding long-term reliability
- 24+ years of experience in production
- Low self discharge rate





## APPLICATIONS

-  Tire Pressure Monitoring Systems (TPMS)
-  Electronic Toll Collection (ETC)
-  Heat cost allocators, etc.

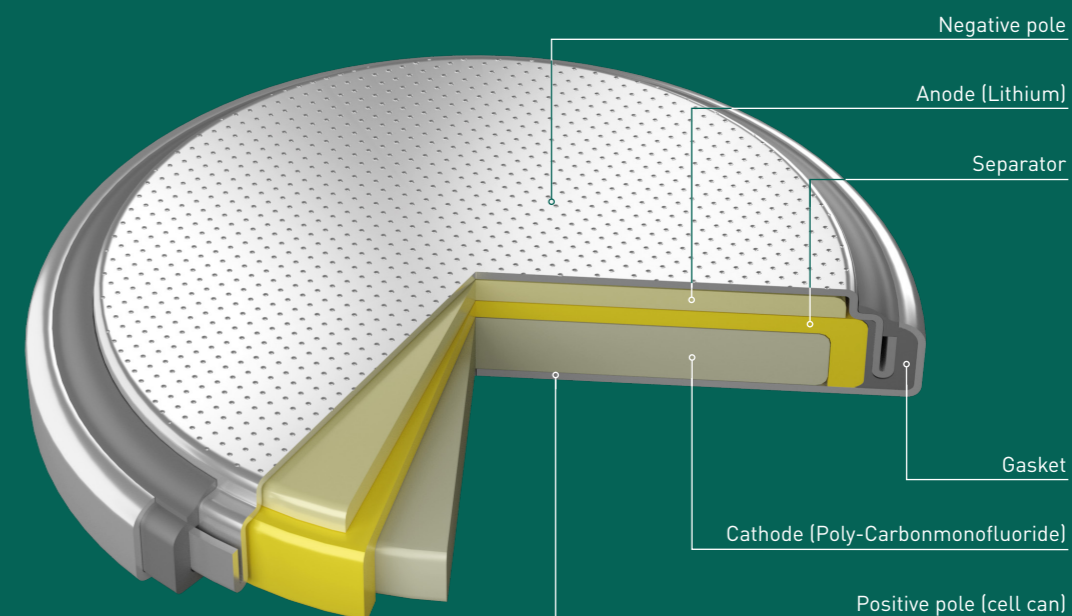
## MODEL NUMBER (EXAMPLE)


 Poly-Carbonmonofluoride Lithium battery  
 Round  
 Battery diameter (in mm)  
 Divided by 10 = battery height (in mm)  
 High temperature type  
**B R 24 77 A**



MODEL NUMBER		Nominal voltage (V)	Nominal <sup>1</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
BR1225A		3	48	12.5	2.5	0.8	-40 to +125
BR1632A <sup>*2</sup>		3	120	16.0	3.2	1.5	-40 to +125
BR2330A <sup>*2</sup>		3	255	23.0	3.0	3.2	-40 to +125
BR2477A <sup>*2</sup>		3	1,000	24.5	7.7	7.9	-40 to +125

## BATTERY INSIDE<sup>\*3</sup>



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

<sup>\*2</sup> Cells are supplied with tabs or lead-wires only. For available configurations please consult the Panasonic homepage or your sales contact.

<sup>\*3</sup> The illustration shows only one example of Lithium battery structure.

# CR LITHIUM COIN MANGANESE DIOXIDE SERIES

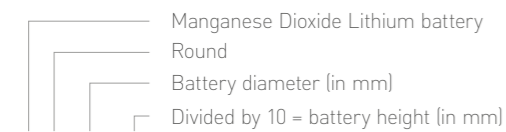
(NON-RECHARGEABLE)

These batteries have a proven track record of excellence in equipment requiring high currents. Additionally Panasonic has many years of manufacturing experience with this battery technology.

## FEATURES

- Good pulse capability
- Stable voltage level during discharge
- Long-term reliability
- Low self discharge rate
- Temperature range: -30°C ~ +85°C<sup>\*1</sup>

## MODEL NUMBER (EXAMPLE)



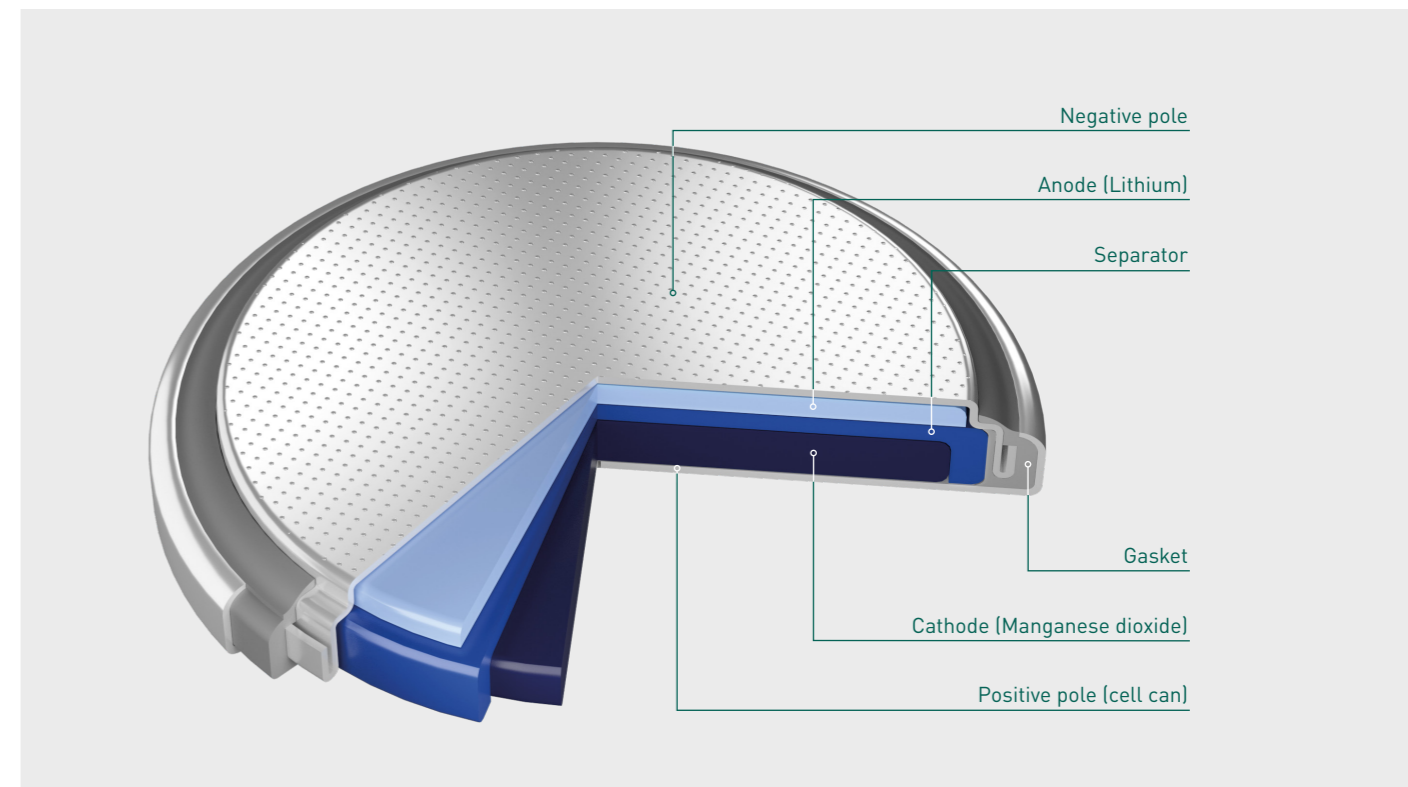
CR 20 32

## APPLICATIONS

- Remote Keyless Entry (RKE)
- Electricity meters
- Medical equipment
- Tracking & RFID
- Vending machines
- Price tags, etc.

MODEL NUMBER	Nominal voltage (V)	Nominal <sup>*2</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
CR1025	3	30	10.0	2.5	0.6	-30 to +85
CR1216	3	25	12.5	1.6	0.7	-30 to +85
CR1220	3	35	12.5	2.0	0.9	-30 to +85
CR1616	3	55	16.0	1.6	1.0	-30 to +85
CR1620	3	75	16.0	2.0	1.3	-30 to +85
CR1632	3	140	16.0	3.2	1.9	-30 to +85
CR2012	3	55	20.0	1.2	1.4	-30 to +85
CR2016	3	90	20.0	1.6	1.6	-30 to +85

MODEL NUMBER	Nominal voltage (V)	Nominal <sup>*1</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
CR2025	3	165	20.0	2.5	2.3	-30 to +85
CR2032	3	225	20.0	3.2	2.8	-30 to +85
CR2330	3	265	23.0	3.0	3.7	-30 to +85
CR2354	3	560	23.0	5.4	5.7	-30 to +85
CR2412	3	100	24.5	1.2	2.0	-30 to +85
CR2450	3	620	24.5	5.0	6.2	-30 to +85
CR2477	3	1,000	24.5	7.7	10.5	-30 to +85
CR3032	3	500	30.0	3.2	6.9	-30 to +85



BATTERY INSIDE<sup>\*2</sup>

<sup>\*1</sup> Please contact Panasonic when anticipating usage in operation temperature 70°C or above.  
<sup>\*2</sup> Based on standard drain and cut off voltage down to 2.0V at 20°C.

<sup>\*1</sup> Based on standard drain and cut off voltage down to 2.0V at 20°C.  
<sup>\*2</sup> The illustration shows only one example of Lithium battery structure.

# CR-A/B LITHIUM COIN HIGH TEMPERATURE MANGANESE DIOXIDE SERIES



(NON-RECHARGEABLE)

Comprising key design elements of the BR-A high temperature series in combination with the benefits of the conventional CR coin series, these batteries offer the best of both worlds in a cost effective manner.

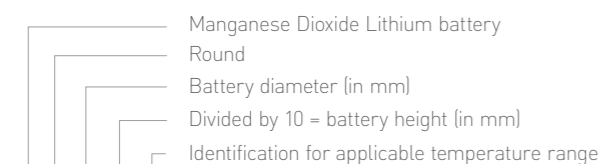
## FEATURES

- Excellent durability in high temperatures (up to 125°C<sup>\*1</sup>) allows various usages automotive electrical components and outdoor devices to be used under severe environments
- Superior pulse discharge characteristics even at low temperatures and can be used in a wide operating temperature
- Excellent long-term reliability enables safe and long-term use

## APPLICATIONS

-  Tire Pressure Monitoring Systems (TPMS)
-  Electric Toll Collection (ETC)

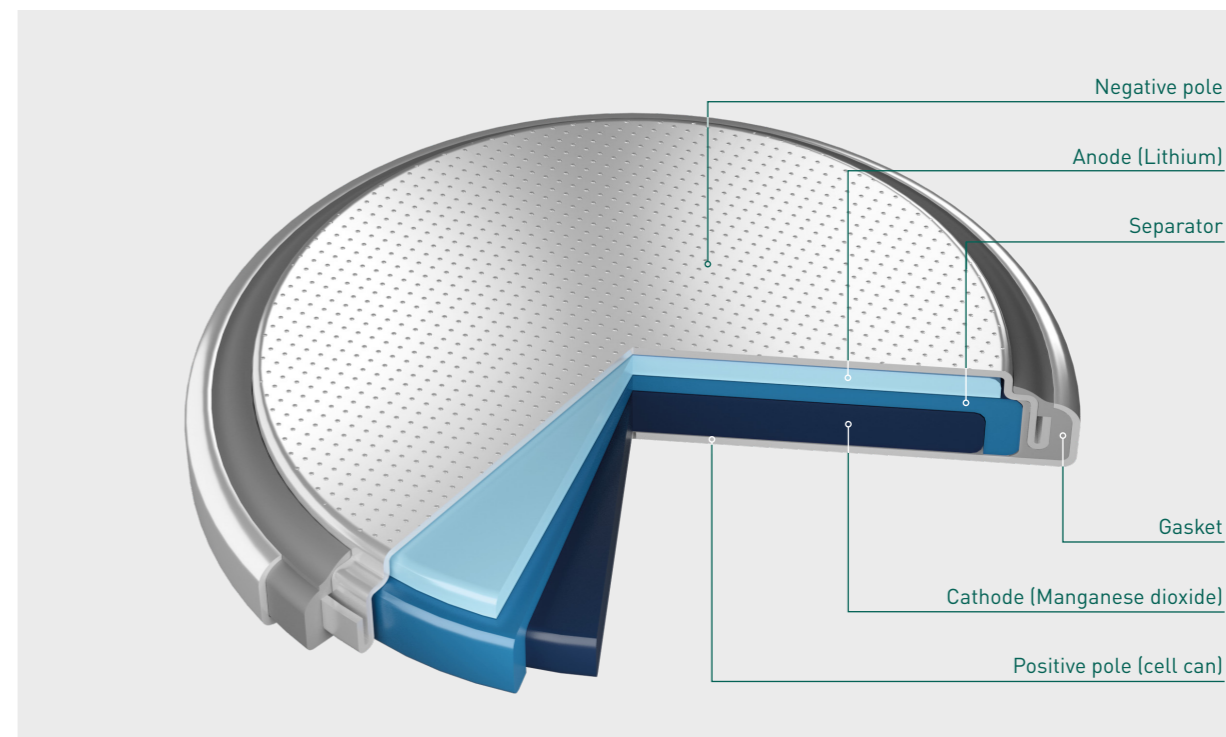
## MODEL NUMBER (EXAMPLE)



C R 20 32 A(or B)

MODEL NUMBER <sup>*1</sup>	Nominal voltage (V)	Nominal <sup>*2</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
CR2032A <sup>*3</sup>	3	210	20.0	3.2	3.0	-40 to +125
CR2032B <sup>*3</sup>	3	210	20.0	3.2	3.0	-40 to +120
CR2050A <sup>*3</sup>	3	345	20.0	5.0	4.1	-40 to +125
CR2050B2 <sup>*3</sup>	3	345	20.0	5.0	4.1	-40 to +120
CR2450A <sup>*3</sup>	3	550	24.5	5.0	6.2	-40 to +125
CR2450B <sup>*3</sup>	3	560	24.5	5.0	6.2	-40 to +105

<sup>\*1</sup> Max. operating temperature +120°C for „B” and +125°C for „A” type models (dia 20mm), +105°C for CR-2450B.  
<sup>\*2</sup> Based on standard drain and cut off voltage down to 2.0V at 20°C.  
<sup>\*3</sup> Cells are supplied with tabs or lead-wires only. For available configurations please consult the Panasonic homepage or your sales contact.



## BATTERY INSIDE<sup>\*1</sup>



<sup>\*1</sup> The illustration shows only one example of Lithium battery structure.

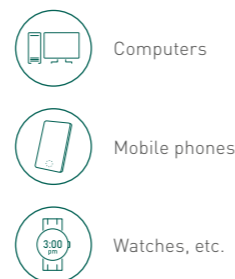
## VL, ML, CTL, AND MT (SECONDARY) LITHIUM COIN SERIES (RECHARGEABLE)

These Panasonic rechargeable Lithium coin batteries are designed mainly for memory back-up applications. Their voltage ranges from 1.5V to 3V.

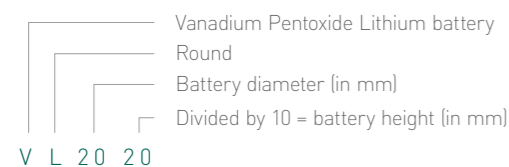
### FEATURES

- Rechargeable Lithium technology
- 1,000 charge-discharge cycles for VL and ML at 10% depth of discharge
- Superior long-term reliability
- Years of experience in production

### APPLICATIONS



### MODEL NUMBER (EXAMPLE)



### VL LITHIUM COIN VANADIUM PENTOXIDE SERIES

MODEL NUMBER	Nominal voltage (V)	Nominal <sup>1</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
VL1220*2	3	7	12.5	2.0	0.80	-20 to +60
VL2020*2	3	20	20.0	2.0	2.10	-20 to +60
VL2330*2	3	50	23.0	3.0	3.50	-20 to +60
VL3032*2	3	100	30.0	3.2	6.30	-20 to +60

### ML LITHIUM COIN MANGANESE SERIES

MODEL NUMBER	Nominal voltage (V)	Nominal <sup>3</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
ML2020	3	45	20.0	2.0	2.20	-20 to +60

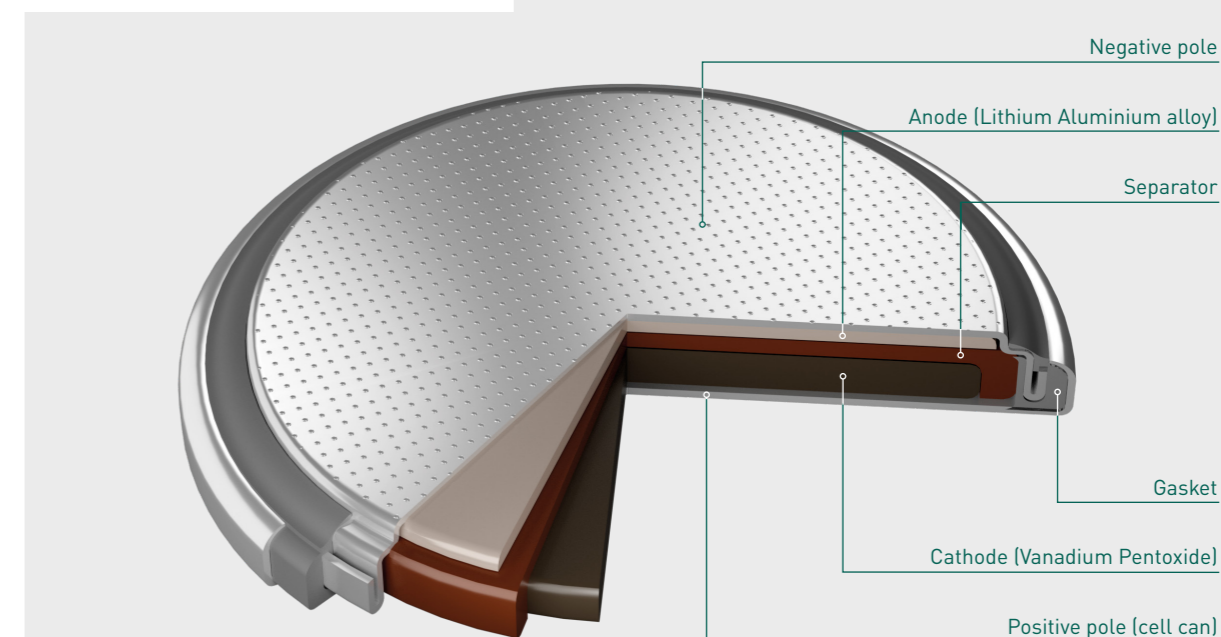
### CTL LITHIUM COIN MANGANESE TITANIUM SERIES

MODEL NUMBER	Nominal voltage (V)	Nominal <sup>1</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
CTL621F	2.3	3.6	6.8	2.1	0.25	-20 to +60
CTL920F	2.3	7.7	9.5	2.0	0.45	-20 to +60
CTL1616F	2.3	13.0	16	1.6	1.00	-20 to +60

### MT LITHIUM COIN MANGANESE TITANIUM SERIES

MODEL NUMBER	Nominal voltage (V)	Nominal <sup>1</sup> capacity (mAh)	Diameter (mm)	Total height (mm)	Weight (g)	Discharging temperature (°C)
MT516F	1.5	1.8	5.8	1.6	0.14	-10 to +60
MT621	1.5	2.5	6.8	2.1	0.23	-10 to +60
MT920	1.5	5	9.5	2.0	0.41	-10 to +60

## BATTERY INSIDE\*2

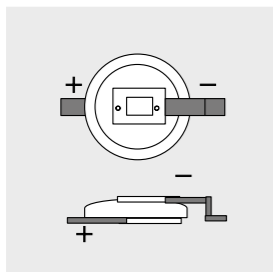


\*1 Based on standard drain and cut off voltage down to 0.5V at 20°C. State-of-Charge ex-factory: ~70%.  
\*2 The illustration shows only one example of Lithium battery structure.

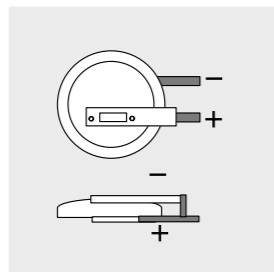
# TERMINAL TYPES

Panasonic offers a broad range of different tabs for our Lithium batteries in order to meet all customer needs. In addition, tailor-made solutions are possible as well.

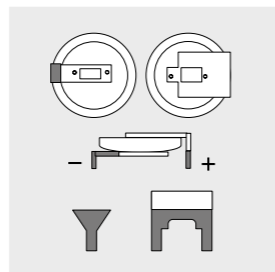
**F TYPE**  
Surface mount  
(wide distance)



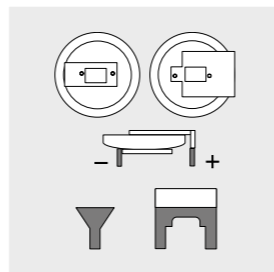
**F TYPE**  
Surface mount  
(short distance)



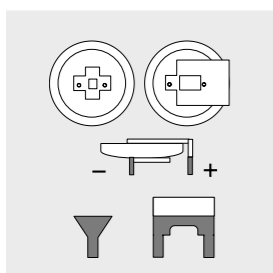
**G TYPE - 3 PINS**  
Through hole horizontal  
mount (wide distance)



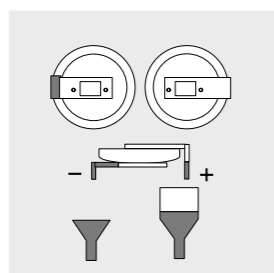
**G TYPE - 3 PINS**  
Through hole horizontal  
mount (normal distance)



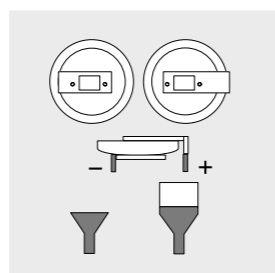
**G TYPE - 3 PINS**  
Through hole horizontal  
mount (short distance)



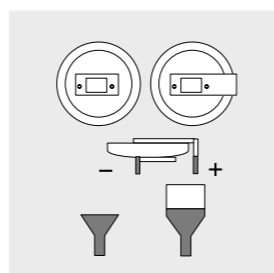
**H TYPE - 2 PINS**  
Through hole horizontal  
mount (wide distance)



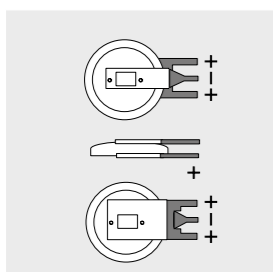
**H TYPE - 2 PINS**  
Through hole horizontal  
mount (normal distance)



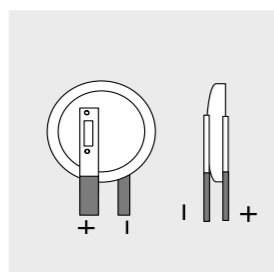
**H TYPE - 2 PINS**  
Through hole horizontal  
mount (short distance)



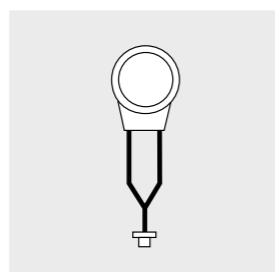
**V TYPE - 3 PINS**  
Through hole vertical  
mount



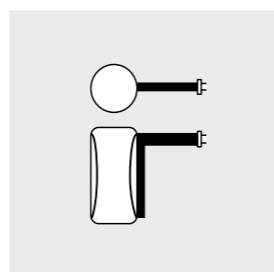
**V TYPE - 2 PINS**  
Through hole vertical  
mount



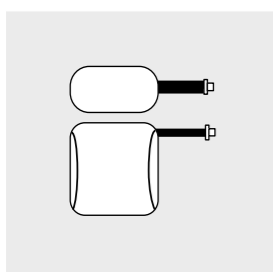
**LEAD WIRE TYPE**  
Coin cell



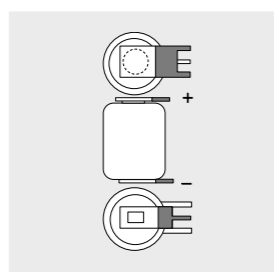
**LEAD WIRE TYPE**  
Single cylindrical cell



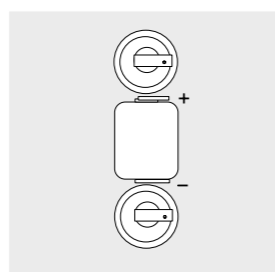
**LEAD WIRE TYPE**  
2 to 6 cells of cylindrical  
batteries in parallel or in series



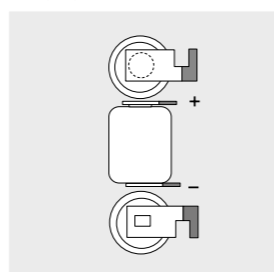
**TAB TERMINAL**  
Cylindrical batteries for  
through hole mounting



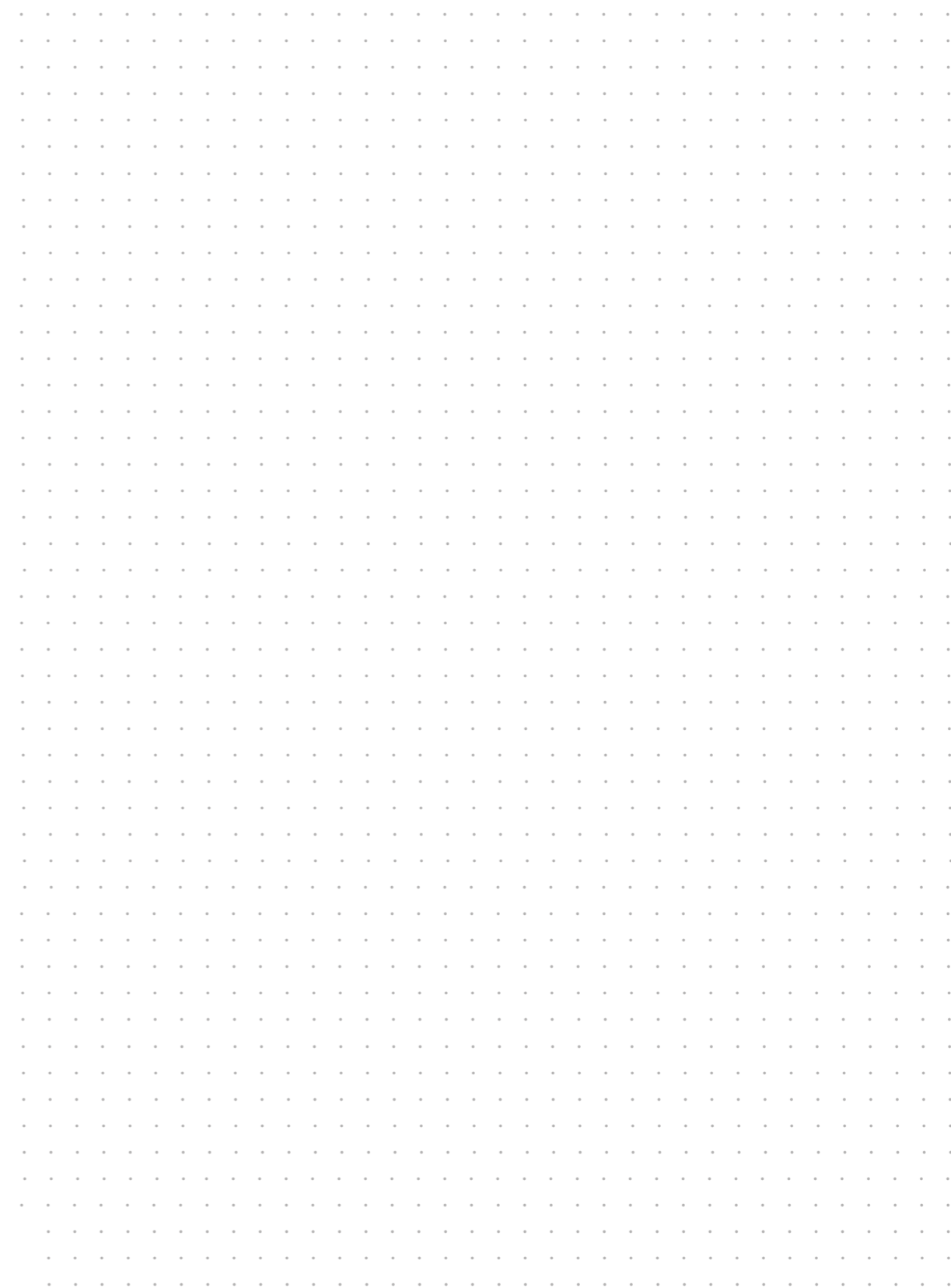
**TAB TERMINAL**  
Cylindrical batteries for  
lead wire attaching



**TAB TERMINAL**  
Cylindrical batteries for  
hanging on PCB (hook type)



# NOTES





#### 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. This literature contains information concerning cells and batteries manufactured by Panasonic Energy Co., Ltd. This information is descriptive only and is not intended to make or imply any representation, guarantee or warranty with respect to any cells and batteries. Cell and battery designs are subject to modification without notice.

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