



# **PRODUCT SPECIFICATION**

## **Lithium/Manganese Dioxide**

### **CR2016/CR2025/CR2032 SIZE BATTERY**

Type Designation: CR2016/CR2025/CR2032  
(Mercury & Cadmium & Lead Free)



**Model No. :** CR2016/CR2025/CR2032  
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## 1. Trademark:

This specification is applicable to PHILIPS Manganese Dioxide Lithium cell, CR2016、CR2025、CR2032

## 2. Law & Regulation Compliances:

This product complies with EU's battery directive (2013/56/EU).

Packaging materials comply with EU's directive on packaging materials and waste (94/62/EC)

## 3. General:

### 3.1 Type designation

IEC/JIS CR2016、CR2025、CR2032

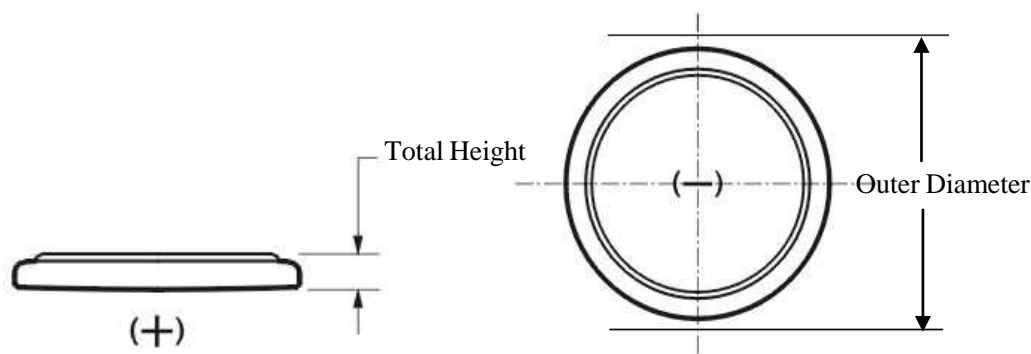
### 3.2 Chemical system: Lithium/Manganese Dioxide (Li/MnO<sub>2</sub>)

### 3.3 Nominal voltage: 3.0 V

### 3.4 Weight: (g)

Designation	CR2016	CR2025	CR2032
Approximate	1.6	2.4	2.9

### 3.5 Dimension (mm)



Designation	CR2016	CR2025	CR2032
Outer Diameter	19.7~20.0		
Total Height	1.4~1.6	2.2~2.5	2.9~3.2

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3.6 Capacity: (20±2°C, RH: 35%-75%)

Designation	CR2016	CR2025	CR2032
Approximate(mAh)	80	160	220
Discharge mode	30kΩ , 24h/d e.v.:2.0V	15kΩ , 24h/d e.v.:2.0V	15kΩ , 24h/d e.v.:2.0V

3.7 Heavy Metal Contents: Hg ≤5 ppm, Cd≤20ppm, Pb≤40ppm

3.8 Operation temperature : -18°C~50°C  
Recommend storage : 0~30°C, 55±20%RH

## 4. Appearance:

The battery visually inspected by unaided eye 30cm away from battery. The battery shall be free from dents, scratch, rust and extruded internal compounds, such as sealing compounds and etc, and serious displacement of artwork. Appearance defects shall not be observed that may adversely affect actual use or performance of batteries.

## 5. Electrical Characteristics

Unless otherwise stated, all measurements are to be performed at a  
**Standard Environment** of

**20°C ± 2 °C**

**55 ± 20% RH.**

All samples are normalized for 8 hours at least at the above environment prior to measurement.

The measurement accuracy for DCV shall be ±0.1% or better.

The load resistance of the total circuit is accurate within ±0.5% of the specified value.

### 5.1 Open Circuit Voltage

		OCV(V)
Initial	Min	3.1
	Normal	3.4

### 5.2 Service Output

Designation	CR2016			CR2025			CR2032		
Load	2kΩ	4.7KΩ	30KΩ	1kΩ	2KΩ	15KΩ	1kΩ	2KΩ	15KΩ
Test mode	24h/d								
End voltage	2.0V								
Initial* MAD	50h	128 h	800 h	50h	100 h	788 h	70h	140 h	1050 h
The delayed discharge performance stored 12 months is above 95% of initial									

h: hour d: day

\*The initial discharge test shall commence within 30 days of manufacture. During stored period, the cells shall be stored under 20±2°C, RH55±20% conditions.

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## **6. Shelf-life:**

10 years

## **7. Packaging Requirements**

The printing on each cell label is legible and permanent. Label defects, if any, shall conform to mutually agree upon limit samples.

7.1 Packaging for shipment and sales shall conform to the mutually agreed to Packaging Specification of the designated customers.

7.2 The total of heavy metal lead, cadmium, mercury, and hexavalent chromium concentration shall not exceed 100 ppm in Packaging materials and printing inks. Ozone depleting substances (ODS) shall not be used in the manufacturing of any packaging.

## **8. Precautions in Handling of Lithium Batteries:**

Lithium batteries contain lithium metal, organic solvents and other reactive materials, which are combustible. Care must be exercised when handling Lithium batteries to ensure that short circuiting, puncturing or deformation does not occur which may result in heat generation, leakage, explosion or possibility a fire which might cause injury.

To ensure safety and to avoid any possibility of any accidents, please observe the following precautions.

8.1 Do not insert batteries in reverse. Observe the + and - markings on battery and equipment. When batteries are inserted in reverse they may be short-circuited or charged. This may cause overheating, explosion, or fire.

8.2 Do not short-circuit batteries

When the positive (+) and negative (-) terminals of a battery are connected directly with each other, the battery becomes short-circuited. This can result in venting, leakage, and possibly fire.

8.3 Do not charge batteries

Attempting to charge a primary battery may cause internal gas and/or heat generation resulting in venting, explosion and possibly fire.

8.4 Do not force discharge batteries

When batteries are force discharged by means of an external power source, the voltage of the battery will be forced below its design capability and gases generated inside the battery. This may result in venting, leakage, explosion and possibly fire.

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**8.5 Do not mix batteries**

When replacing batteries, replace all of them at the same time with new batteries of the same brand and type. When batteries of different brand or type are used together or new and old batteries are used together, some batteries may be charged due to a difference of cell voltage or overdischarged due to a difference of capacity. This may result in venting and/or explosion.

**8.6 Exhausted batteries should be immediately removed from equipment and disposed of.**  
When discharged batteries are kept in the equipment for a long time, electrolyte leakage may occur causing damage to the equipment.

**8.7 Do not overheat batteries**

When a battery is overheated, electrolyte may be released and separators may deteriorate. This may result in leakage, venting, explosion and possibly fire.

**8.8 Do not weld or solder directly to batteries**

The heat from welding or soldering directly to a battery may cause leakage, venting, explosion, or fire.

**8.9 Do not dismantle batteries**

When a battery is dismantled, the components may cause personal injury or fire.

**8.10 Do not deform batteries**

Lithium batteries should not be crushed, punctured, or otherwise mutilated. Such abuse may result in leakage, venting, explosion, or possibly fire.

**8.11 Do not dispose of batteries in fire**

When batteries are disposed of in fire, the heat build-up may cause explosion and/or fire. Do not incinerate batteries except for approved disposal in a controlled incinerator.

**8.12 A lithium battery with a damaged container should not be exposed to water**

Lithium metal in contact with water may produce fire and/or hydrogen gas.

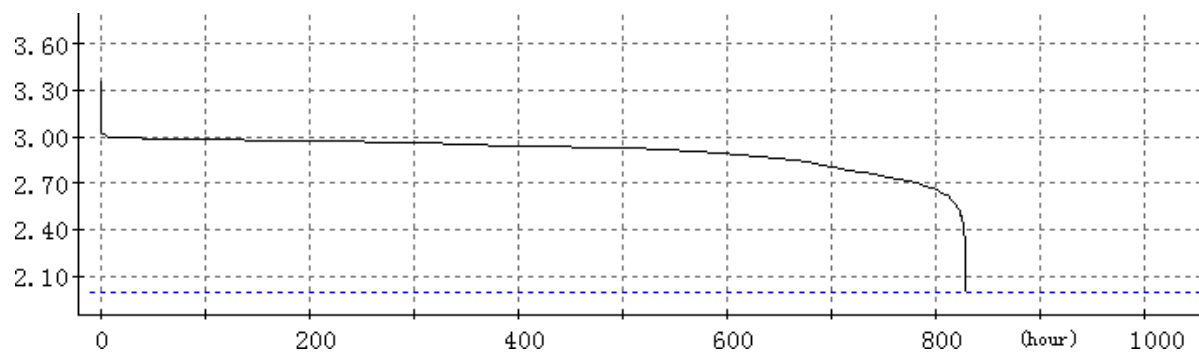
**8.13 Keep batteries out of the reach of children**

Especially keep batteries which are considered swallowable out of the reach of children. In case of ingestion of a cell or battery, seek medical assistance promptly.

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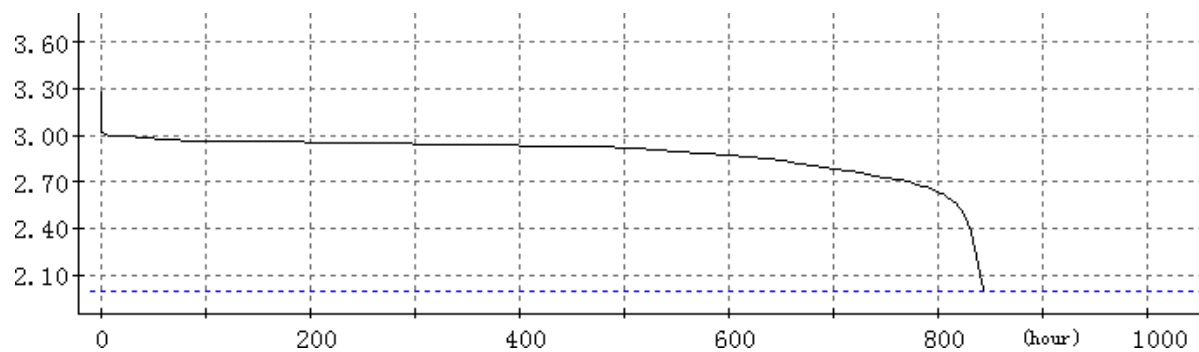
**CR2016**

30K $\Omega$  24h/d e.v.=2.0 V



**CR2025**

15K $\Omega$  24h/d e.v.=2.0 V



**CR2032**

2K $\Omega$  24h/d e.v.=2.0 V

