TECHNICAL SPECIFICATION
FOR
MANGANESE DIOXIDE LITHIUM BATTERY
TYPE:CR2025

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We reserve all rights for the change of product specification and any information without any prior notice.

1. *Scope*

This specification is applicable to the Manganese Dioxide Lithium Battery CR2025 supplied by Guangdong TIANQIU Electronics Technology Co. Ltd.

2. *Designations*

2.1Defining

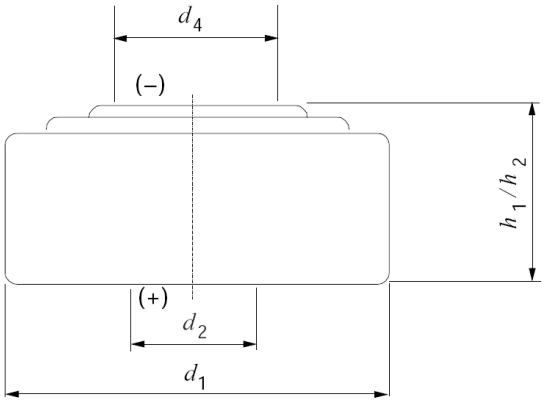
At the temperature of 20±2℃, loading at 15kΩ continuous discharge, till the voltage down to 2.0V

3. *Designations and Dimensions*

3.1 Designations：

Manganese Dioxide Lithium Battery CR2025

3.2 Dimensions



SPEC code	specification standard(mm)	
	MAX	MIN
h1/h2	2.5	2.2
d1	20.0	19.7
d2	-	-
d4	-	8.0

Note: h1 battery maximum total height
h2 battery positive and negative minimum distance between contacting surfaces
d1 Maximum and minimum diameter of the battery
d2 minimum diameter of the anode contact area
d4 minimum diameter of the cathode surface

4. *Product characteristic*

Item	Characteristic
Nominal capacity	150mAh /0.45Wh
Nominal voltage	3.0V
Discharge Voltage	2.0 V
Suggested continuously discharge	0.2mA
Suggested maximum pulse curren	15mA
Service temperature	-20~60℃
Storage Temperature	0℃～35℃
Storage humidity	45% ~ 75 % RH (no condensate)
Dimensions	maximum height:2.5mm Maximum diameter: Φ20mm
Average weight	2.3g

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5. *Technical requirements*

5.1 Test conditions

Unless otherwise specified, the test conditions shall be, as a general rule, at the temperature of 20±2℃ and the relative humidity of 60±15%.

5.2 Electrical characteristics

NO.	Item	Test condition	Requirement
5.2.1	storage characteristics	Sampling plan：MIL-STD-105E, General Inspection Lever Ⅱ, Single Sampling, AQL=0.4 Remark: Load voltage test method: 15KΩ/1S, The initial samples shall be tested within 30 days after delivery	Open Circuit Voltage(V) load voltage(V) Initial： 3.10-3.50 3.0-3.40 12 months @ RT: 3.0-3.40 3.0-3.40
5.2.2	Service output	Load resistance:15kΩ; Discharge method:24h/d continuously discharge; End point voltage 2.0V Remark: The initial samples shall be tested within 30 days after delivery.	Initial≥750hrs 12 months @ RT≥720hrs
5.2.3	Temperature characteristics	Load resistance:15kΩ; Discharge method:24 hrs/d continuously discharge; End point voltage 2.0V	0±2℃≥650hrs 60±2℃≥735hrs
5.2.4	Over-discharge	Continuously discharge: 15KΩ, End point voltage 1.2V	No leakage, No deformation; N=9, Ac=0, Re=1
5.2.5	High temp. storage	60℃, RH below 70% for 30days	No leakage; N=40, Ac=0, Re=1
5.2.6	Short circuit test	The battery short circuit in 55 ℃ environment, When the battery shell after the temperature dropped to 55 ℃ continue to short circuit at least 1 hrs	No explosion、No fire ; N=5，Ac=0，Re=1.

5.2.2&5.2.3 acceptance standard:

1) 9 pieces of battery will be tested for each discharging method.
2) The average discharging time from each discharging method shall be equal to or greater than the specified figure, and no more than one battery has a service output less than 80% of the specified figure.
3) One retest is allowed to confirm the results if the first test didn't meet the requirements.

5.3 Expiration date

1 year storage in the conditions of GB/T 8897.1-2013, appendix E part

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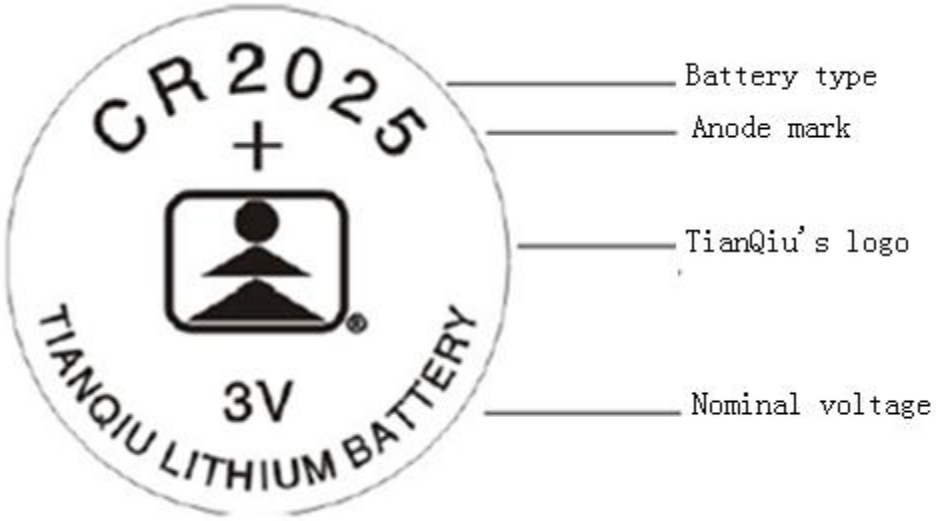
6. *Packing and marking*

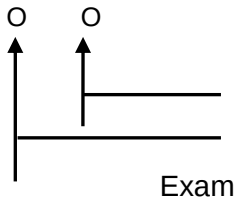
6.1Marking Design

Any specific design and packing requirements will be accommodated as required. But as a general, the following markings will be printed, stamped or impressed on the body of the battery:



6.2 date code

Manufacturing marks: the year and month of product shall be marked on the negative (-) terminal side.



Month of product（1 letter）

Year of product（the last number of Christian era）

Example：

69 (manufactured in September,2016)

6X (manufactured in October,2016)

6Y (manufactured in November,2016)

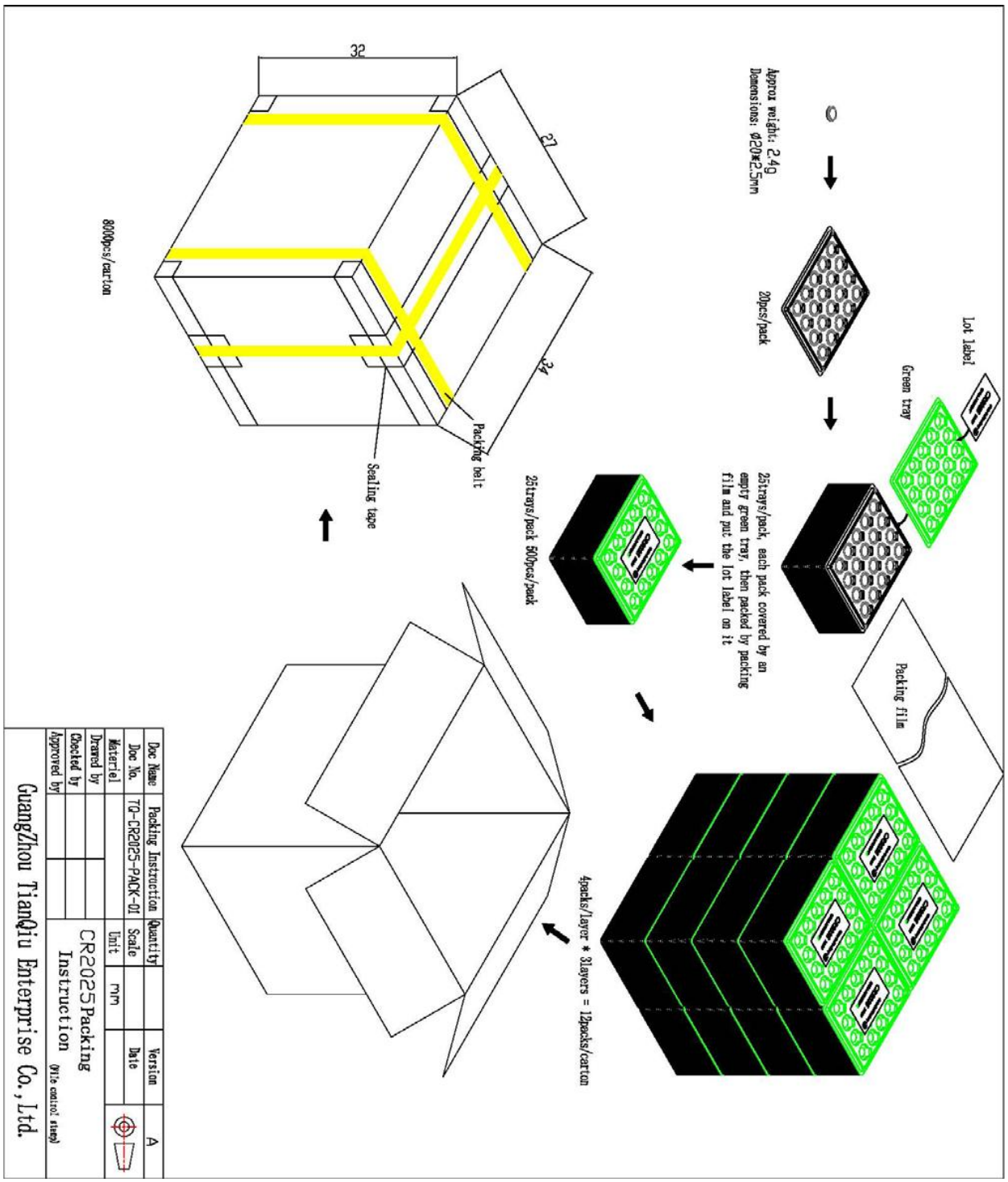
6Z (manufactured in December,2016)

Month of product：

January to September…… （1-9）

Oct, Nov, Dec……（X,Y,Z）

6.3 Packing Picture



7. *Caution for Use*

1) Since the battery is not designed to be charged, there are risks of electrolyte leakage or causing damage to the device if the battery is charged.
2) The battery shall be installed with its "+" and "-" polarity in correct position, otherwise may cause the battery to be charged or over-discharged.
3) Short-circuiting, heating, disposing of in fire and disassembling the battery are prohibited.
4) Battery cannot be forced discharge, which lead to excess internal gas generation and, may result in bulging, leakage and explosion.
5) New and used batteries cannot be mix used at the same time, when replaced batteries, it is recommend to replace all and with the same brand type.
6) Exhausted batteries should be removed from compartment to prevent over-discharge, which cause leakage and damage to the device.
7) Direct soldering is not allowed, which will damage the battery.
8) Keep the battery out of the reach of children to prevent swallow, in case of accident should contact physician at once.
9) The battery should not be dismantled and deformed.

caution:

- If a battery is leakage and materials contact eyes, flush immediately with running water for at least 15 minutes. Consult an ophthalmologist at once.
- If battery emits an odor, fever, discoloration, deformation or any abnormal phenomena appeared in the process of use/storage, removed the battery immediately from the device and dispose of the battery.

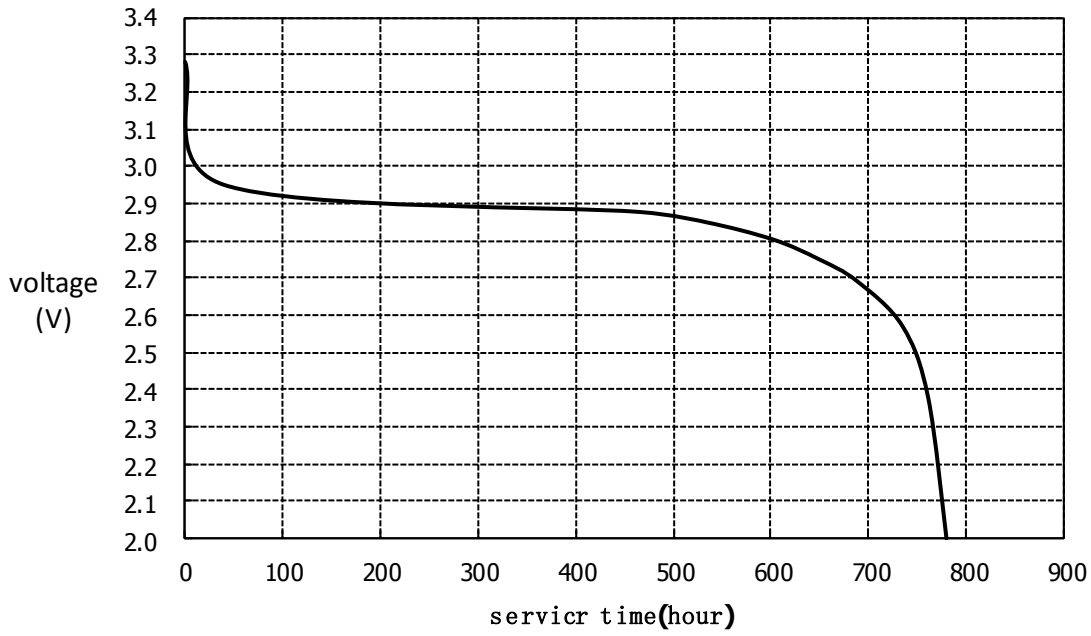
8. *Referenced Standards*

IEC 60086-1:2015 –Primary Batteries –Part 1: General

IEC 60086-2:2015–Primary Batteries –Part 2: Physical and electrical specifications

IEC 60086-4:2019 –Primary Batteries –Part 4: Safety of lithium batteries

9. *Discharge Curves*



Discharge method:15KΩ, 24 hours/day EV 2.0V
temperature of 20±2℃

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PRODUCT SPECIFICATION

ZINC CARBON R03 SIZE BATTERY

Type Designation : R03 Super Heavy Duty

(PVC/Foil Jacket)

Prepared by :

Checked by :

Approved by :

Issued Date : 2016-03-31

Zhongyin (Ningbo) Battery Co., Ltd.
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Tel: 86 574 87491087 Fax: 86 574 87493903
Web Site:http://www.sonluk.com

RECORD OF REVISION

TYPE DESIGNATION: R03 Super Heavy Duty (PVC/Foil Jacket)

REV. No.	REASON	CONTENTS	DATE	PREPARE	REMARK
0	Initial Released		2016-03-31	Xuan.Q	

1. Scope:

This specification is applicable to Pairdeer battery, R03 Super Heavy Duty (PVC/Foil Jacket), distributed by ZHONGYIN (NINGBO) BATTERY CO., LTD.

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

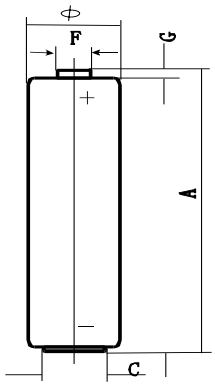
IEC/JIS R03

3.2 Chemical system: $Zn/NH_4Cl\text{-}ZnCl_2\text{-}H_2O/MnO_2$

3.3 Nominal voltage: 1.5 V

3.4 Weight: Approximate 7.3 g

3.5 Dimension (mm)



/	min	max
Φ	9.8	10.5
A	43.5	44.5
C	4.3	-
F	-	3.8
G	0.8	-

3.6 Heavy Metal Contents:

Hg	Cd	Pb
≤1ppm	≤20ppm	≤1000ppm

3.7 Capacity: Approximate 320mAh (50mA, 1h/12h, 24h/d, 20±2℃, e.v.= 0.9V)

3.8
Operation temperature : -18℃~35℃
Recommend storage temperature : Not exceed 35℃

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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 ± 2°C**
55 ± 20% RH.
All samples are normalized for 8 hours at least at the above environment prior to measurement.
The digital voltmeter (DCM) is with the precision of 1mV (internal resistance not less than 1 Megohm).
The load resistance of the total circuit is accurate within ±0.5% of the specified value.

5.1 Open circuit voltage and closed circuit voltage (Load resistance 3.9Ω, 0.3S)

/	OCV(V)	CCV(V)
Initial	≥1.58	≥1.40

5.2 Service output

Load		3.9Ω	5.1Ω	24Ω	5.1Ω	50mA	75Ω	10Ω
Test mode		24h/d	4m/h,8h/d	15s/m,8h/d	1h/d	1h/12h,24h/d	4h/d	1h/d
End voltage		0.9V	0.9V	1.0V	0.8V	0.9V	0.9V	0.9V
Unit		m	m	h	m	h	h	m
Applications		Reference	Portable lighting	Remote control	Toy	Digital Audio	Radio/Clock	Digital audio
Initial	MAD	36	88	7.3	70	6.5	26	170
	Normal	40	98	8.2	85	7.5	26.7	185

m: minute h: hour d: day

Remark: 1) The initial discharge test shall commence within 30 days of manufacture. During stored period, the Batteries shall be stored under 20±2℃, RH 55±20% conditions.

2) Lot release service output test is conducted by 3.9Ω continuous discharging to 0.9 volts.

3) MAD：minimum average duration--our guarantee discharge value.

4)Normal：normal data, it's our normal daily value, battereis dicharge value are on this as base to be upper or lower.

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6. Leakage Resistance

Over discharge leakage test

Test conditions: 20±2℃, RH 55±20%, 3.9Ω continuous discharge to 0.60V.
Number of test samples: 9 batteries
Requirement: no visible leakage.

7. Safety Characteristics

7.1 User Drop Test

This test simulates the situation when a battery is accidentally dropped.
Test conditions: Undischarged test batteries shall be dropped from a height of 1 m onto a concrete surface. Each test battery shall be dropped six times, twice in each of the three axes. The test batteries shall be stored for 1 h afterwards.
Number of test samples: 5 batteries
Requirement: No fire, No explosion.

7.2 Short-circuit explosion-proof characteristics

This test simulates an external short circuit of a battery during daily handling of batteries.
Test conditions: Positive and negative terminals of an undischarged battery shall be connected directly. The circuit shall be completed for 24 h or until the battery case temperature has returned to ambient. The resistance of the inter-connecting circuitry shall not exceed 0,1 Ω.
Number of test samples: 5 batteries
Requirement: No fire or explosion; Leakage is allowable.

8. Expiry Date:

36 months

9. Expiry Date Marking:

9.1 Unless otherwise specified, each battery will carry a manufacturing date code followed by month and year of manufacturing for domestic and manufacturing date code followed by month and year of expiry for export. (Shelf life 36 months)

10. Packaging Requirements

10.1 It is recommended that packaging for shipment and sales according with Packaging Specification of Pairdeer batteries. For example, 2pcs batteries in a shrink, 20 shrinks in a display box, and 5*2*3 display boxes in a final outer carton , and 5*3*7 outer cartons on a pallet. Flow chart as next page:

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

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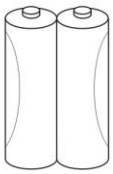
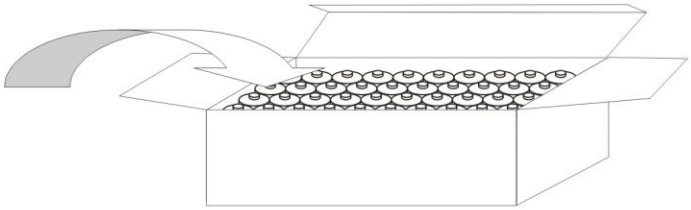
1



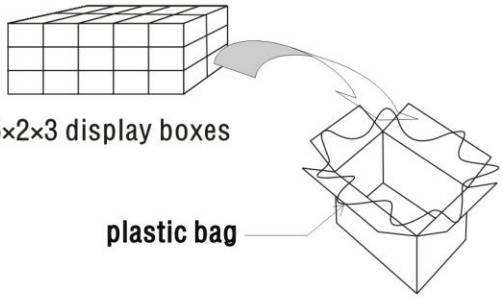
2pcs–shrink(PVC or PET)

2



4×10 pcs in a display box

3



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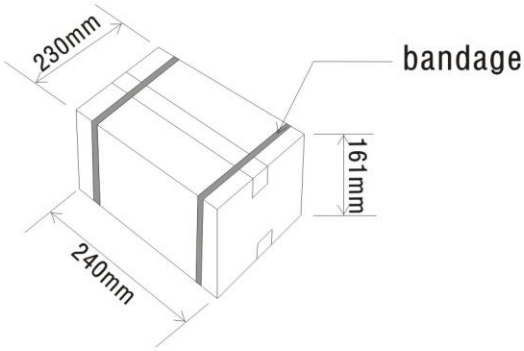
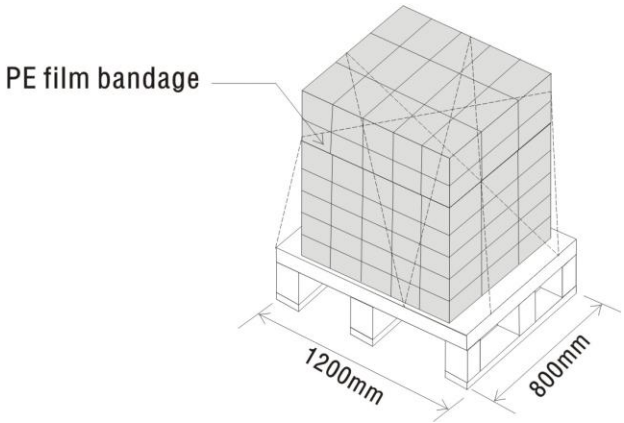


Gross weight:about 10.2kg

5



(5×3×7) outer boxes

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11. Precautions in Handling of Batteries:

11.1 Do not disassemble or short-circuit batteries.

11.2 Do not recharge batteries.

11.3 Do not dispose of batteries in fire.

11.4 Do not allow metal objects to contact the battery terminals.

11.5 Do not mix with used or other battery type (such as alkaline with carbon zinc).

11.6 Do not solder the batteries directly. If soldering or welding connection to the battery is required, consult our engineer for proper methods.

11.7 Do not over-discharge batteries. Force discharging batteries by external power source in a series may cause explosion.

11.8 To install or remove batteries, follow the equipment manufacturer's instructions.

11.9 Keep battery away from small children. If swallowed, consult a physician at once.

11.10 Remove batteries from device when it is not in use.

12. Storage

12.1 Store in cool, dry place before use.

12.2 It is recommended that the storage temperature be lower than 35℃.

12.3 Do not keep batteries at relative humidity of 70% or above for long time.

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