



ROYALE ROBOOTER E60
POWERCHAIR RANGE
USER MANUAL

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1 Introduction



S339488 – Power Chair – Royale Robooter E60–A 10” Omni-Wheeled – Grey + Headrest + Bluetooth Attendant Remote (Includes 20AH Lithium Battery) 150kg

S339489 – Power Chair – Royale Robooter E60–Pro-A 12” Omni-Wheeled – Green + Headrest + Bluetooth Attendant Remote (Includes 20AH Lithium Battery) 150kg

Thank you for purchasing your Royale Robooter E60 Powerchair.

As part of ongoing product development, product specifications may change without prior notice. Any updates that affect safety or usage for existing users will be clearly communicated.

Please note: All dimensions are approximate and may vary.

This product is designed for an intended service life of 5 years. To ensure safe and optimal performance, only use components or accessories that are officially approved for this model

This user manual will help you to use and maintain your Powerchair safely.

Do not use your Powerchair until this manual and all relevant booklets have been read and understood. If the user manual was not included with your Powerchair, please contact your dealer immediately.

1.1 Further Information

If you have any questions about the use, maintenance or safety of your Powerchair, please reach out to your local authorised Royale Medical dealer.

1.2 Symbols used in this user manual

 **Warning**

Important Notice for the User:

Any serious incident involving this device must be reported to the manufacturer.

 **Caution**

General User Information

Failure to follow these instructions may result in personal injury, product damage, or harm to the environment.

2 Safety & Precautions

Make sure to follow the instructions marked with these warning symbols carefully.

Failure to do so could lead to physical injury, or cause damage to the Powerchair or surrounding environment.

2.1 Safety & Precautions: Symbol Description



Warning

Text marked with this symbol indicates that ignoring the instructions could result in serious injury.



Caution

Text marked with this symbol indicates that ignoring the instructions could result in injury, or cause damage to property.

2.2 Safety & Precautions: Temperature



Warning

- Avoid touching the Powerchairs motors at any time. During operation, the motors remain in motion and can become very hot. After use, allow at least 30 minutes for them to cool down before making contact, as touching them too soon may cause burns.
- When the Powerchair is not in use, keep it out of direct sunlight for prolonged periods. Parts such as the seat, backrest, and armrests can heat up significantly when exposed to the sun, potentially causing burns or skin irritation.

The recommended storage conditions for the Powerchair are as follows:

- Temperature range: -10°C to 50°C
- Relative humidity: not exceeding 95%
- Atmospheric pressure: 56–110 kPa

The Powerchair should be stored in a well-ventilated area, free from harmful or corrosive gases. Do not stack or place heavy objects on top of the Powerchair.

Avoid storing the product near heat sources or in direct sunlight for extended periods.

If the Powerchair will not be used for a long time, ensure it is fully charged and powered off before storage. For storage periods exceeding one month, recharge the battery fully before resuming use or continuing storage. Please refer to 7.6 Storage.

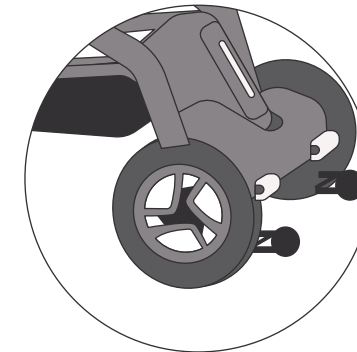
2.3 Safety & Precautions: Moving Components



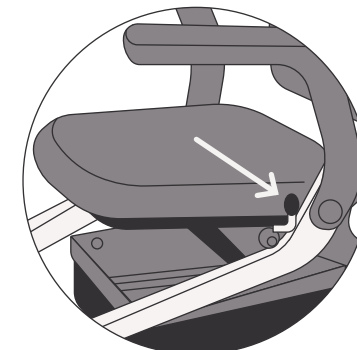
Warning

A Powerchair contains several moving components. Contact with these parts can cause serious injury or damage to the Powerchair or user and should always be avoided.

- Wheels (front and rear)



- Backrest folding latch



2.4 Safety & Precautions: Electromagnetic Radiation



The Powerchair has been tested to meet applicable electromagnetic compatibility (EMC) requirements. However, despite these tests, electromagnetic interference cannot be completely ruled out.

External sources of electromagnetic radiation — such as mobile phones, large medical equipment, or other strong emitters — may affect the Powerchairs performance.

Similarly, the Powerchair itself may cause interference with certain electromagnetic systems, including:

- Automatic shop doors
- Security or anti-theft systems in stores
- Remote-controlled garages

If you experience any such interference or operational issues, please contact your dealer immediately.



When using two-way radios, walkie-talkies, CB radios, amateur radios, public mobile radios, or any other high-powered transmitting devices, the Powerchair must be brought to a complete stop and switched off.

Use of cordless phones, mobile phones, and hands-free devices is allowed; however, if any irregular or abnormal operation of the Powerchair occurs, stop immediately and turn the Powerchair off.

2.5 Safety & Precautions: Electromagnetic Interface (EMI)



Electromagnetic interference (EMI) is caused by external electromagnetic energy sources such as radios, television transmitters, CB radios, garage door openers, and cordless or mobile phones. Such interference may affect the Powerchairs control system.

In certain cases, EMI can result in unintended behaviour — including brake failure, unexpected power activation, steering malfunction, or even permanent damage to the control system.

The following cable information is provided for reference to ensure compliance with electromagnetic compatibility (EMC) requirements.

Cable	Max. cable length Shielded/unshielded		Number	Cable classification
AC power line	1.8M	Unshielded	1 Set	AC Power
DC power line (USB cable)	0.95M	Unshielded	1 Set	DC Power

Important Information on Electromagnetic Compatibility (EMC)

- This electrical medical device requires special precautions regarding EMC and must be operated in accordance with the EMC guidance provided in this user manual. The equipment complies with the IEC 60601-1-2:2014 standard for both immunity and emissions. However, certain precautions must still be observed.
- This equipment with essential performance, has been designed for indoor and outdoor use, includes essential performance features critical to its safe operation.
- **Warning:** Avoid using this equipment in close proximity to other electronic devices, as this may lead to improper operation. If simultaneous use is unavoidable, both devices should be monitored to ensure they function correctly.
- The use of accessories, transducers, or cables other than those specified or supplied by the manufacturer may increase electromagnetic emissions or reduce the device’s immunity, potentially leading to malfunction.
- **Warning:** Portable RF communication equipment (including antennas, cables, and external antennas) must be kept at least 30 cm (12 inches) away from any part of the Powerchair including its cables. Failure to do so may degrade performance.

- **Warning:** When operating the Powerchair near strong AM, FM, or TV broadcast antennas (within approximately 1.5 km), verify that the equipment functions normally before use to ensure continued safety and correct performance throughout its service life.
- If the AC input power is interrupted during battery charging, the process will stop. Charging will automatically resume once the power supply is restored.

EMI Compliance table (Table 1)

Table 1 – Emission

Phenomenon	Compliance	Electromagnetic environment
RF emissions	CISPR 11 Group 1, Class B	Home healthcare environment
Harmonic distortion	IEC61000-3-2 Class A	Home healthcare environment
Voltage fluctuations and flicker	IEC61000-3-3 Compliance	Home healthcare environment

EMS Compliance Table (Table 2-5)

Table 2 – Enclosure Port

Phenomenon	Basic EMC Standard	Immunity test levels
		Home healthcare environment
Electrostatic discharge	IEC61000-4-2	±8kV contact ±2kV, ±4kV, ±8kV, ±15kV air
Radiated RF EM field	IEC61000-4-3	20 V/m 26Mhz-2.5GHz 80% AM at 1kHz 10V/m 80MHz-2.7GHz *80% AM at 1kHz
Proximity fields From RD Wireless communications equipment	IEC61000-4-3	Refer to Table 3
Rated power Frequency Magnetic fields	IEC61000-4-8	30A/m 50Hz or 60Hz

Table 3 – Proximity fields from RF wireless communications equipment

Test frequency (MHz)	Band (MHz)	Immunity test levels
		Home healthcare environment
385	380-390	Pulse modulation 18Hz, 27V/m
450	430-470	FM, ±5kHz deviation 18Hz sine, 28V/m
710	704-787	Pulse modulation 217Hz sine, 28V/m
745	800-960	Pulse modulation 18Hz since, 28V/m
780		
810		
870		
930	1700-1990	Pulse modulation 217Hz sine, 28V/m
1720		
1845		
1970		
5785		

Table 4 – Input a.c. power port

	Standard	Home healthcare environment
Electrical fast Transients/burst	IEC 61000-4-4	$\pm 2\text{KV}$ 100kHz repetition frequency
Surges Line-to-line	IEC 61000-4-5	$\pm 0.5\text{kV}$, $\pm 1\text{kV}$
Conducted disturbances induced by RF Fields	IEC 61000-4-6	3V, 0.15MHz-80MHz 6V in ISM bands and amateur radio bands Between 0.15MHz and 80MHz 80%AM at 1kHz
Voltage dips	IEC 61000-4-11	0% U_T ; 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°
		0% U_T ; 1 cycle and 70% U_T ; 25/30 cycles Single phase: at 0°
Voltage interruptions	IEC 61000-4-11	0% U_T ; 25/30 cycles U_T =rated input voltage

Table 5 – Signal input/output parts port

Phenomenon	Basic EMC standard	Immunity test levels
		Home healthcare environment
Conducted disturbances induced by RF fields	IEC 61000-4-6	3V.0.15MHz-80MHz6V in ISM bands and amateur radiobands between 0.15MHz and 80MHz 80%AM at 1kHz

2.6 Safety & Precautions: Choking Hazard

 **Warning**

This Powerchair contains small parts that may pose a choking hazard to young children under certain conditions.

2.7 Safety & Precautions: Using a Powerchair Lift (Vehicle Mounted)

 **Warning**

Lifts are installed in vehicles such as vans and buses, as well as in buildings, to assist users in moving safely between different levels.

- **This Powerchair is not suitable to use as a seat in a vehicle**
- Ensure that both the user and all caregivers fully understand the lift manufacturer’s operating instructions before use
- Never exceed the lift manufacturer’s specified safe working load or recommended load distribution
- Always switch off the Powerchair while on the lift. Failure to do so may result in accidental joystick movement, causing the chair to roll off the platform — note that the roll-stop may not prevent this
- Confirm that the Powerchair is in drive mode (not freewheel mode) before using the passenger lift

2.8 Safety & Precautions: Manual Handling

 **Warning**

Do not lift the seating system by any removable parts, as this may cause damage to the Powerchair or result in injury to the user.

2.9 Safety & Precautions: Intended Use

The Royale Robooter E60 is a Powerchair designed to deliver an optimal driving experience both indoors and outdoors.

With its compact design and straightforward construction, the Royale Robooter E60 is an excellent choice for users seeking easy servicing, refurbishment, and recycling.

The Royale Robooter E60 is built to accommodate a variety of individual needs, preferences, and conditions, and is available in the following configuration:

- Rear wheel drive 10": Royale Robooter E60 A
- Rear wheel drive 12": Royale Robooter E60 Pro-A

2.9.1 Safety & Precautions: Area of Application; The User

Powerchairs are designed exclusively for individuals who are unable to walk or who have limited mobility, for their personal use both indoors and outdoors.

Operating a Powerchair requires adequate cognitive, physical, and visual abilities. The user must be capable of assessing and correcting their actions while driving the Powerchair.

The Powerchair is intended for a single user only and must not carry more than one person at a time. The maximum weight capacity (150kg) — including the user and any installed accessories — is indicated on the serial number label attached to the chair's chassis.

Before operating the Powerchair, the user must be familiar with the contents of this manual. Additionally, a qualified specialist must provide thorough instruction before the user participates in public traffic. Initial driving sessions should always be conducted under the supervision of a trained instructor or advisor.

Indications

The Royale Robooter E60 is intended for individuals who are unable to walk or have limited mobility due to:

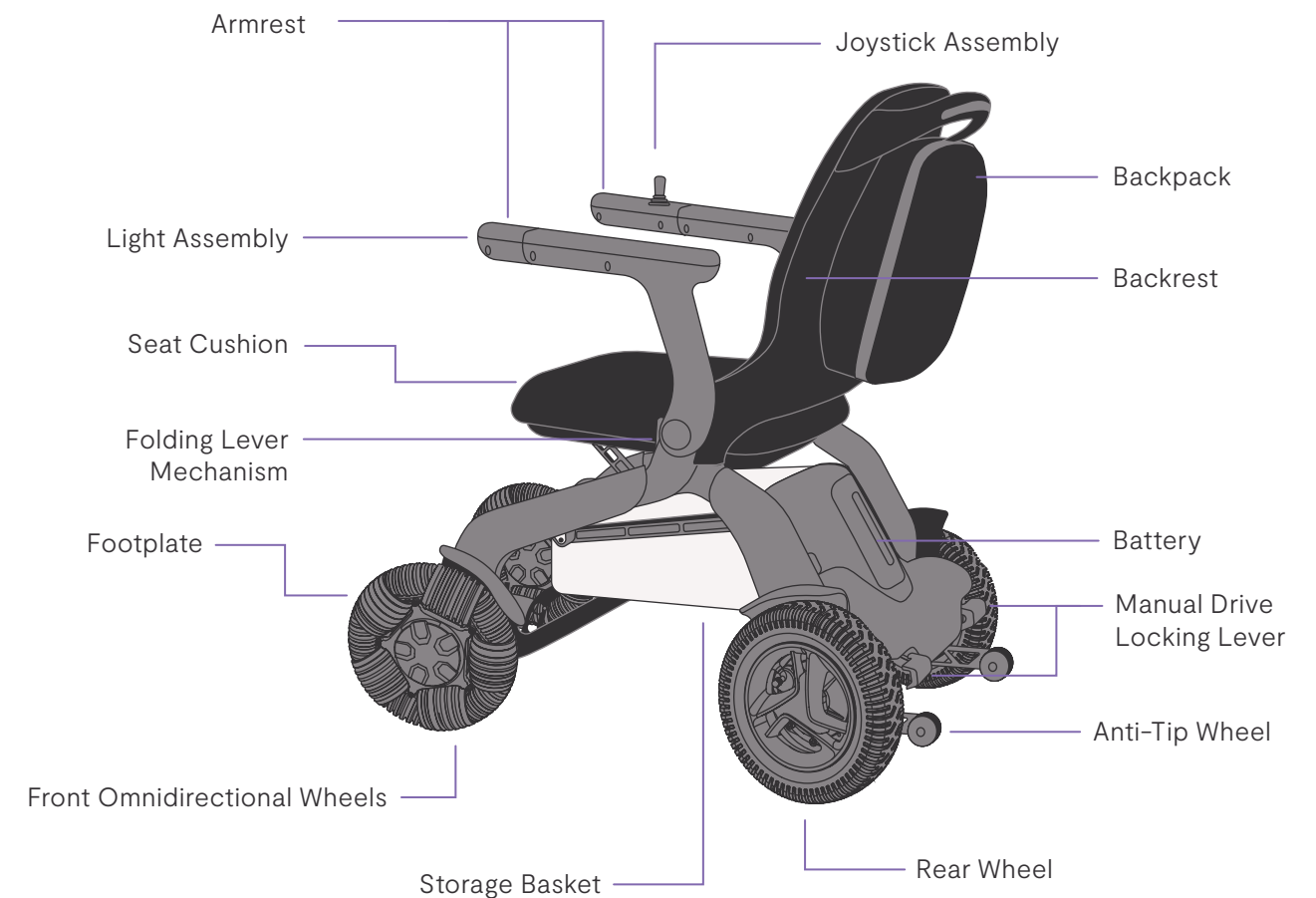
- Paralysis
- Amputation of a leg
- Deformities or defects of the limbs
- Joint contractures or injuries
- Medical conditions such as heart or circulatory disorders, balance impairments, or cachexia

It is also suitable for elderly users who retain sufficient upper body strength.

Contraindications

The Powerchair should not be used by individuals who experience:

- Impaired perception or awareness
- Significant balance difficulties
- Inability to maintain a stable seated position



Please note that operating a Powerchair requires adequate cognitive, physical, and visual abilities. The user must be capable of evaluating their actions while driving and correcting them when necessary. Royale Medical cannot evaluate these abilities or ensure the safe use of any additional components and therefore assumes no liability for any resulting damage.

Always refer to the operating instructions for both the Powerchair and any attached components. Ensure the user is properly instructed in their safe operation and made aware of all specific warnings that must be read, understood, and followed.



Warning

Do not operate the Powerchair if you are under the influence of medication that may affect your ability to drive safely.

- Sufficient vision is essential for the safe operation of the Powerchair in all situations.
- The Powerchair is designed for a single occupant only; it must not carry more than one person at a time.
- Children must never use or ride in the Powerchair without supervision.
- Users must always remain within the Safe Working Load (SWL) specified for the Powerchair. Exceeding the maximum weight limit — which includes the user and any accessories or carried items — may affect stability, performance, and safety, and could result in equipment damage or personal injury.



Caution

The Powerchair user is fully responsible at all times for adhering to all applicable local safety regulations and guidelines.

2.9.2 Safety & Precautions: Area of Application; The Environment

This Powerchair is designed for indoor and outdoor use. This Powerchair has been tested in accordance with ISO 7176-9 Climatic Test. When used outdoors, it should only be driven on smooth, paved surfaces such as roads, pavements, footpaths, or bicycle paths. Always adjust your speed to match the surrounding conditions and environment.



Warning

- Drive cautiously on wet or slippery surfaces caused by rain.
- Exercise extra care when driving at higher speeds. Reduce the maximum speed when indoors, on pavements, or in pedestrian areas.
- Avoid driving off high obstacles or curbs.
- Do not attach any additional weight or accessories to the Powerchair without approval from a qualified specialist, as this may compromise the product's stability.



Caution

- Avoid exposing the Powerchair to sea water, as it is corrosive and may cause serious damage.
- Keep the Powerchair away from sand, which can enter moving parts and lead to excessive wear.
- Do not operate the Powerchair in temperatures below -10°C or above +50°C.
- Never use the footplate to open doors.
- Do not push, pull, or tow objects with the Powerchair.
- Avoid driving through puddles or standing water.

3 Features

- ▶ Designed for both indoor and outdoor use, with a stable, comfortable ride
- ▶ Lightweight design for improved portability
- ▶ Foldable and compact, facilitating storage and transport
- ▶ Max user weight up to 150 kg
- ▶ Up to 18 km range on a full charge, depending on conditions.
- ▶ Smart control system including:
 - ▶ Smartphone app remote control (forward, backward, sideways movement).
 - ▶ Voice prompts
- ▶ Integrated USB ports for charging devices on the go
- ▶ Backrest reclines from 8° to 38° to enhance posture and comfort.
- ▶ Width-adjustable armrests provide personalised comfort and support.

Specifications 4

Product Model	S339488 (E60-A)	S339489 (E60-Pro-A)
Type class (Class A, Class B or Class C)	Class B	Class B
Folding Mode	Manual Folding	Manual Folding
Maximum Speed	8 km/h	10 km/h
Maximum Barrier Height	60 mm	80 mm
Minimum Turning Radius	800 mm	850 mm
Total Weight	33.6 kg	36.8 kg
Battery Number	1	1
Battery Weight	2.8 kg	2.8 kg
Specifications of Front and Rear Wheels	10-inch omnidirectional front wheel, 10-inch rear wheel	12-inch omnidirectional front wheel, 12-inch rear wheel
Maximum Load	150 kg	150 kg
Battery Capacity	20 AH	20 AH
Overall Dimension (Length*Width*Height)	987*624*932 mm	1052*640*956 mm
Folding Shape Dimension (Length*Width*Height)	770*640*500 mm	855*640*525 mm
Seat Width	420 mm	420 mm
Theoretical Driving Distance	17 km (12 AH) 23 km (20 AH) 29 km (25 AH)	17 km (12 AH) 23 km (20 AH) 29 km (25 AH)
Weight Capacity of the Storage Basket	≤5 kg	≤5 kg
Type(s) of tyres that can be used on the wheelchair	Omnidirectional front, Pneumatic rear	Omnidirectional front, Pneumatic rear
Weight Without Battery	30.8 kg	34 kg
Overall Length (including legrest)	987 mm	1052 mm
Static Stability Downhill	15°	15°
Static Stability Uphill	15°	15°
Static Stability Sideways	6°	6°
Dynamic Stability Uphill	15°	15°
Minimum Braking Distance (from max. speed)	1020 mm	1020 mm
Footrest to Seat Distance	415 mm	415 mm
Leg to Seat Surface Angle	100°	100°
Armrest to Seat Distance	230 mm	230 mm
Distance Between Arms (Adjustable)	455 - 515 mm	455 - 515 mm
Front Location of Armrest Structure	500 mm	500 mm
Backrest Angle (Adjustable)	8-38°	8-38°
Waterproof Grade	IPX4	IPX4

4.1 Drive Range

Please refer to the specification tables in this manual for details on energy consumption and maximum drive range.

The maximum driving range of this device is *23km (*standard 20AH battery), measured under optimal conditions. Actual performance may vary based on factors such as terrain, inclines, curves, obstacles, driving style, load, and temperature.

For extended trips or longer distances, we recommend the following:

- Fully charge the battery before use
- Minimise the weight of any carried items
- Plan your route to avoid steep slopes and obstacles
- Maintain a steady speed and avoid frequent or abrupt stops

4.2 Driving on a Slope

The Royale Robooter E60 powerchair has been designed and tested for safe operation on slopes or gradients of up to *15°. (*Refer to the specification for more detail)



Warning

In certain situations, your Powerchair may become unstable.

- Before attempting to climb or descend a slope or kerb, use caution when shifting your body weight for balance.
- To improve stability when travelling uphill, lean forward and keep the seat and backrest in an upright position.
- When going downhill, sit upright or slightly recline the seat to maintain balance.
- If you are uncertain about the Powerchair's ability to safely handle a slope or kerb, do not attempt it—find an alternative route instead.
- Stopping distances on slopes can be significantly longer than on level ground

4.3 Obstacles & Kerbs

The Royale Robooter E60 has a maximum obstacle or kerb climbing height of 60 mm (E60-A) and 80 mm (E60-Pro-A).

- Never descend a kerb while travelling backwards.
- Do not attempt to climb or descend steps or use escalators. Doing so is unsafe and may cause injury or damage to the Powerchair.
- For users with limited upper body stability, it is recommended to use appropriate restraint systems to maintain an upright posture when ascending or descending ramps, kerbs, or obstacles.

Climbing kerbs:

- Always approach kerbs at a 90° angle, driving slowly and steadily
- Stop the Powerchair as soon as the wheels make contact with the kerb.
- Apply steady power to the motors to lift the front of the chair onto the kerb, then slightly increase power to allow the drive wheels to climb smoothly.
- Keep the joystick as straight and forward as possible throughout the manoeuvre.

Descending kerbs:

- Always approach kerbs at a 90° angle, driving slowly and steadily
- Move the Powerchair slowly and carefully forward until both front wheels are positioned at the edge of the kerb, maintaining a 90° angle to it.
- Descend the kerb slowly and smoothly with the drive wheels — do not stop while moving down. You may feel more secure by leaning slightly backward, but even if you cannot, the Powerchair remains stable within its designed limits.
- For added security, it is recommended to use the seat belt while going down the kerb.

5 Instructions for Use

5.1 Assembling the Royale Robooter E60 Powerchair

The Royale Robooter E60 Powerchair is compact, folding in seconds for easy transport. Its simple two-step manual mechanism makes folding and unfolding effortless, allowing users to quickly switch between travel and use.

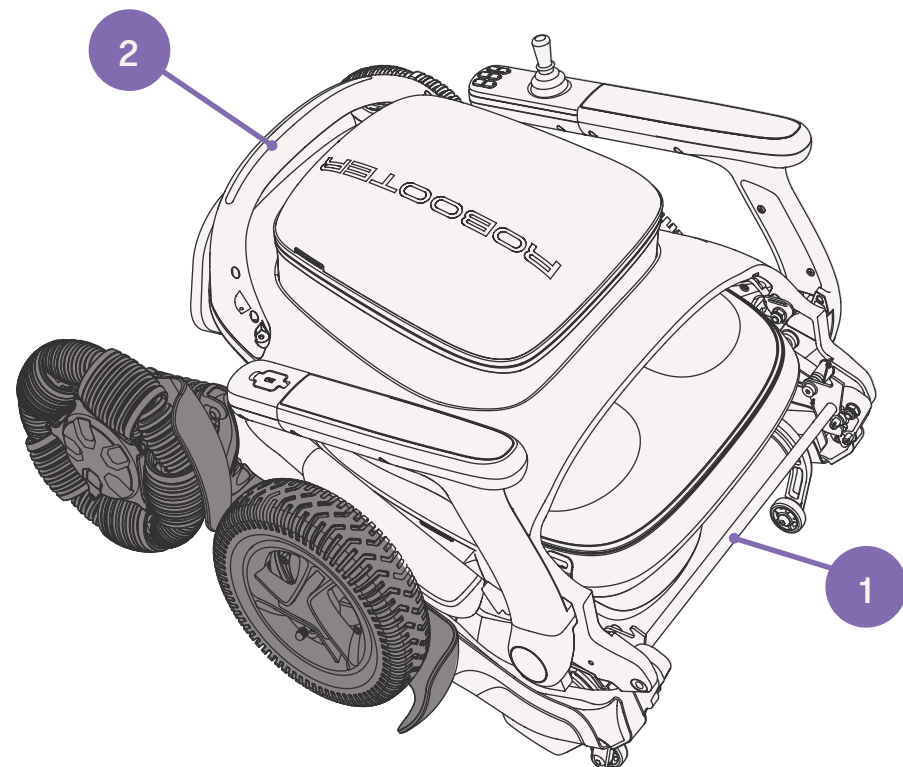


Figure 4.2.1.1

5.1.1 Unfolding the Royale Robooter E60 Powerchair

Open the packaging box, remove the Powerchair, and take off all protective padding. Begin by unfolding the footrest, then press the backrest folding lever mechanism (position 1 in figure 4.2.1.1) and pull the backrest push bar with the other hand (position 2 in figure 4.2.1.1) until the Powerchair is expanded. When you hear a “click”, it indicates that the Powerchair has fixed into the locking pin and the Powerchair has been unfolded. Only sit in the Powerchair once it has been securely locked into position. Failure to do so may cause damage to the Powerchair and could result in personal injury.



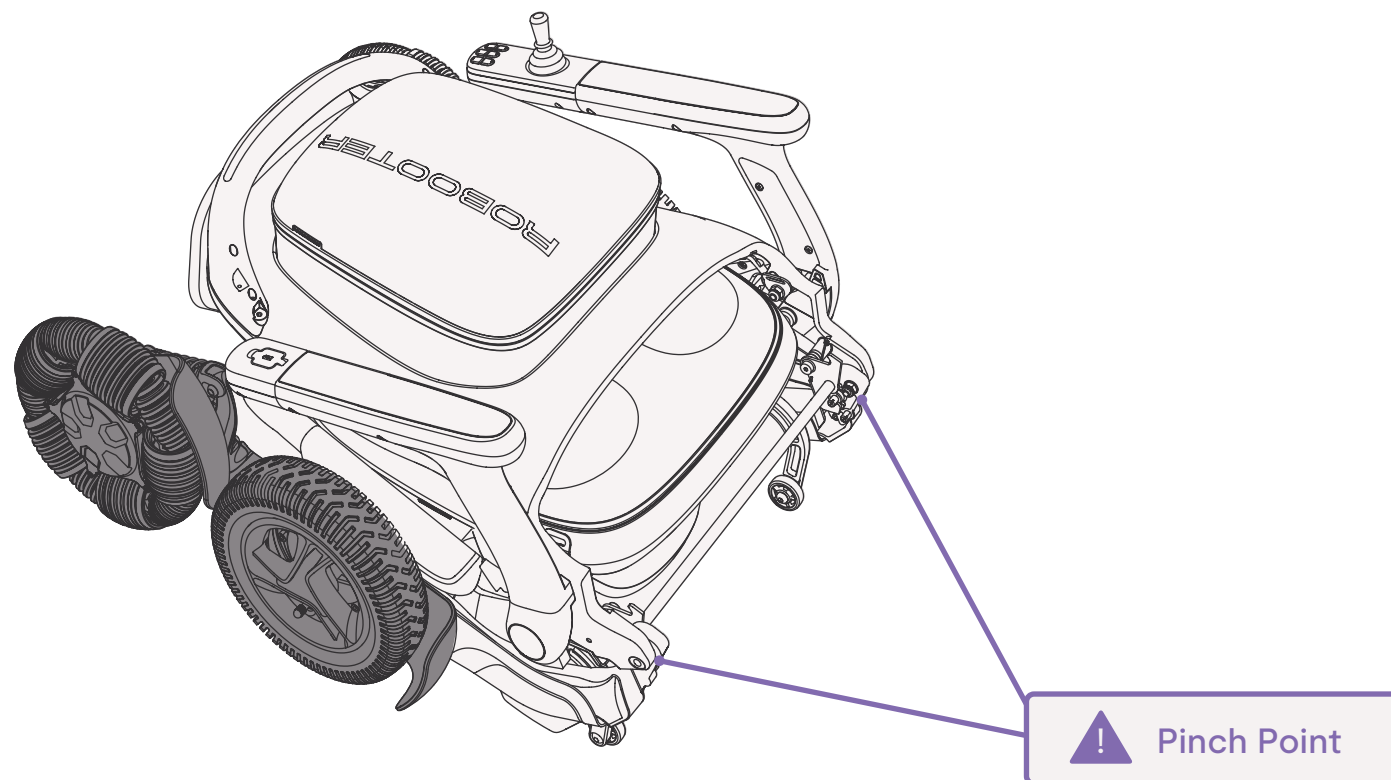
Figure 4.2.1.2

5.1.2 Folding the Royale Robooter E60 Powerchair

To manually fold the Powerchair, press the folding switch with one hand (position 1 in Figure 4.2.1.2) while pressing the backrest bar downwards with the other hand (position 2 in Figure 4.2.1.2). Continue until the Powerchair is completely folded.

NB: before folding the Powerchair, remove all items from the storage basket to prevent damage.

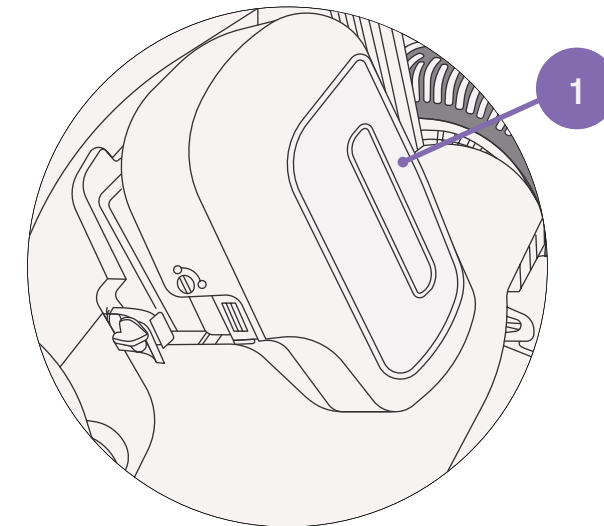
Warning



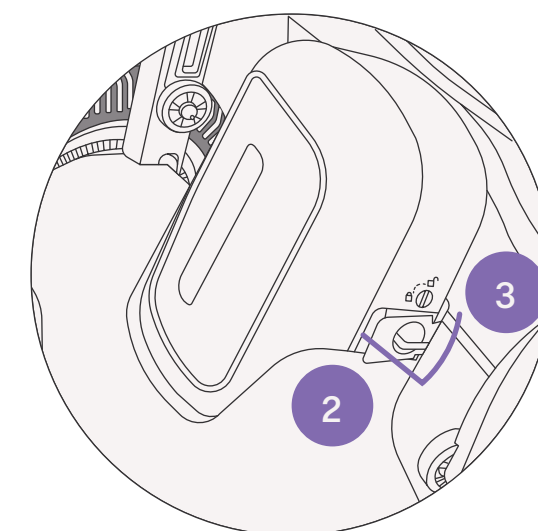
During the folding or unfolding process, avoid touching the areas marked in the above image. Failure to follow this instruction may result in a risk of pinching or injury.

5.2 Installing the Battery

Insert the battery into the rear of the Powerchair. Ensure the cell aligns with the receiving port.



Manually close the battery locking clips by rotating the knob.



The horizontal state of the knob is locked

5.2.1 Charging the Battery

Before first use, fully charge the new battery to ensure it reaches about 90% of its optimal performance. After each use, recharge the battery fully and operate the Powerchair again — after four to five full charge cycles, the battery will reach near 100% efficiency, helping to extend its lifespan.

When a battery no longer holds a charge, purchase and install new batteries as needed. Always replace the Powerchairs batteries with compatible, manufacturer-approved batteries to ensure safe operation, optimal performance, and compliance with warranty conditions.

Ensure the old batteries are appropriately recycled and disposed to prevent environmental pollution.

If the Powerchair will not be used for an extended period, it is recommended to charge the battery every two weeks and run the Powerchair for at least 20 minutes to maintain battery health.

Do not charge the battery outdoors. Keep it away from open flames and heat sources while charging. Always charge the Powerchair in a clean, dry, and well-ventilated area, free from flammable, explosive, or chemical substances.

All replaced or discarded batteries must be recycled or disposed of according to local regulations.

There is two methods of charging the battery

Charging Method 1: Connect the charger, then insert the charger plug into the upper controller to begin charging (see Figure 4.8.1).

Charging Method 2: Remove the battery and connect the charger plug directly to the battery's charging port to begin charging (see Figure 4.8.2).

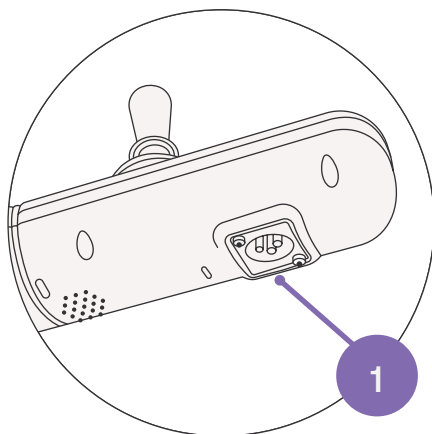


Figure 4.8.1

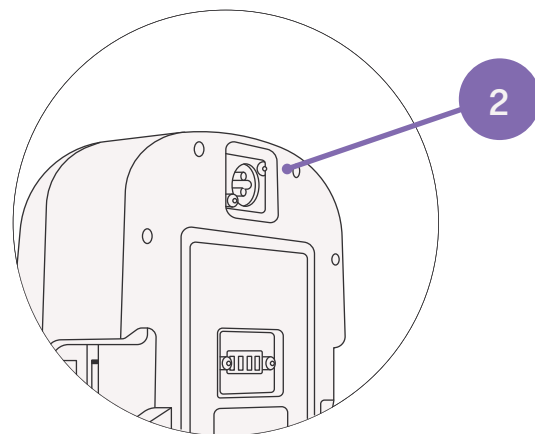


Figure 4.8.2

When the charging port of the Powerchair is connected to the charger, the upper controller screen will display a CHARGING icon, indicating that the Powerchair is currently charging.

Once the battery is fully charged, the screen will show a FULL CHARGED icon, confirming that charging is complete.

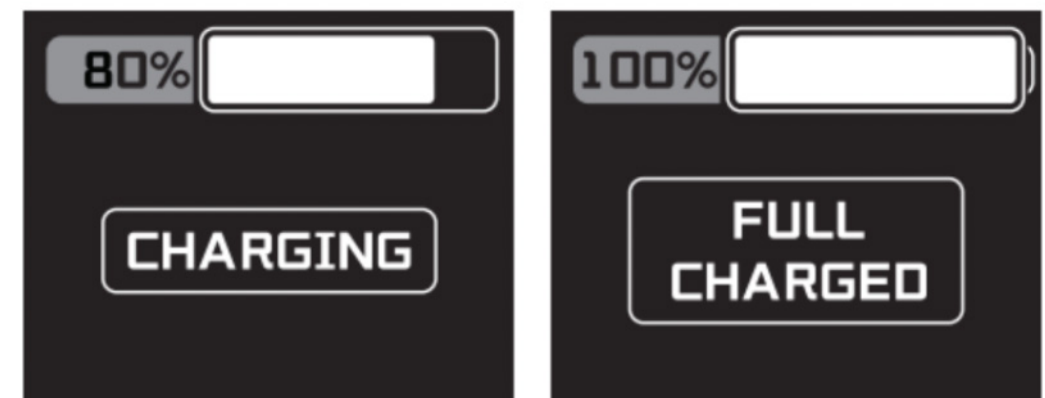


Figure 4.3.3.6

Battery Care

The following battery care recommendations have been developed in cooperation with battery manufacturers to help users achieve the best performance and longest lifespan from your maintenance-free batteries. Failure to follow these guidelines may result in reduced battery performance and shorter operating range.

- Use only the approved charger that is compatible with your Powerchair.
- Charge the batteries every night, regardless of how much the Powerchair has been used during the day.
- Always charge in a well-ventilated area.
- Do not interrupt the charging cycle once it has started.
- For long-term storage (over 15 days), fully charge the batteries, then disconnect the main battery lead.
- Failing to regularly recharge the batteries may cause permanent damage, reduced travel distance, and early battery failure.
- Do not “top up” or partially charge the batteries during the day — wait until evening for a full overnight charge.
- Following these steps will help ensure healthier batteries, greater travel range, and a longer overall battery life.

5.2.2 Using the Charger

The battery charger is an essential part of the Powerchair, allowing for quick and efficient charging to achieve a full battery. The external charger has been designed to charge the Lithium-Ion battery (24V).

The chargers are equipped with safety features designed to prevent accidents or damage caused by incorrect battery connection, overheating due to faults, or attempts to charge batteries of the wrong voltage.

To charge the battery:

- Ensure the Powerchair is turned off and the rechargeable battery is properly connected to it.
- Insert the three-pin metal plug of the charger into the three-hole socket on the controller or directly into the battery.
- Plug the other end of the charger into a standard electrical outlet. The blue light indicates charging is in progress, and the green light shows that the battery is fully charged.
- Once charging is complete, disconnect the charger and power cable.

Warning

- Never attempt to open, modify, or tamper with the batteries under any circumstances. If you have any concerns, contact your local authorised Royale Medical dealer for assistance.
- Do not leave the batteries or battery pack unattended while charging.

Warning

As with all mains-powered electrical equipment, always replace blown fuses with a fuse of the same type and rating as specified.

- Using an incorrect fuse type may increase the risk of fire, cause damage to the charger, or prevent it from functioning properly.

5.3 Joystick Assembly

The joystick can be interchanged between left and right armrests to suit the user's preferences.

1. Before swapping the left and right armrest controllers, make sure to turn off the power to the Powerchair.
2. Using a hex wrench, remove the three Allen screws located beneath the armrest controller, then disconnect the wiring harnesses for the left and right controllers.
3. Swap the controllers, reconnect the harnesses, insert each controller into the corresponding armrest slot, and securely tighten the socket screws with the hex wrench. (See Figure 4.5.1)

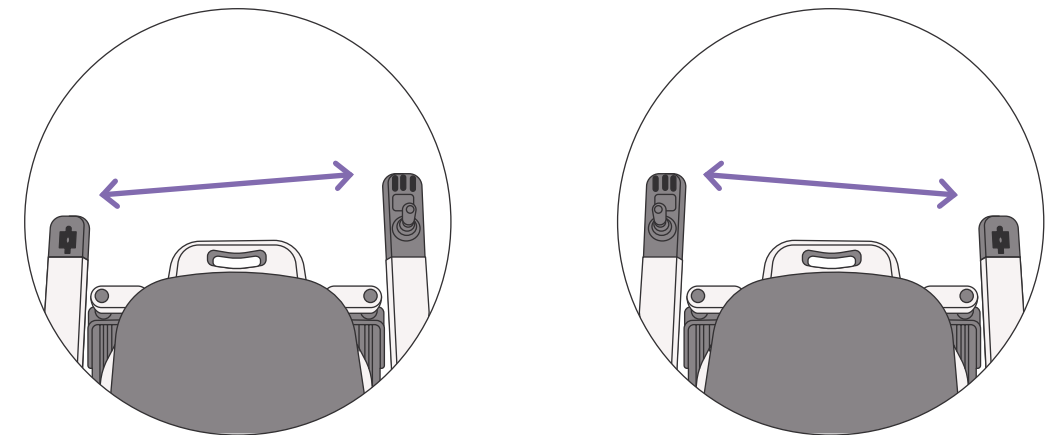


Figure 4.5.1

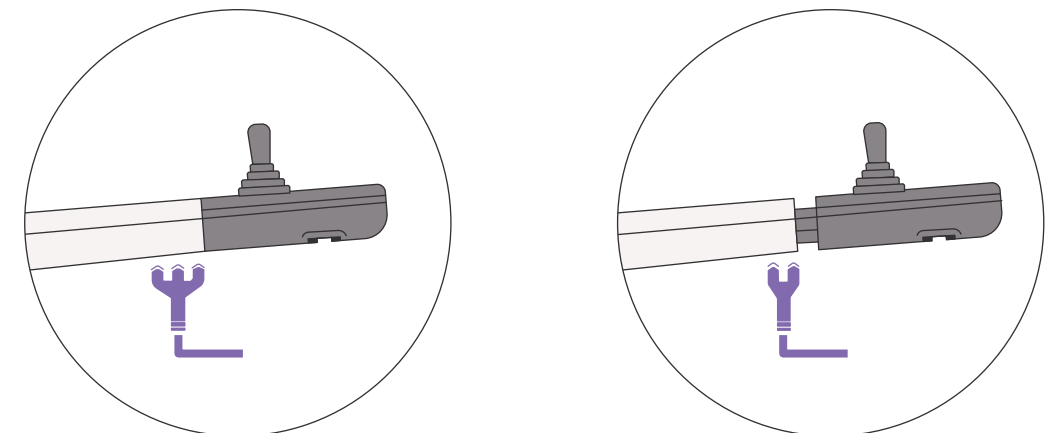
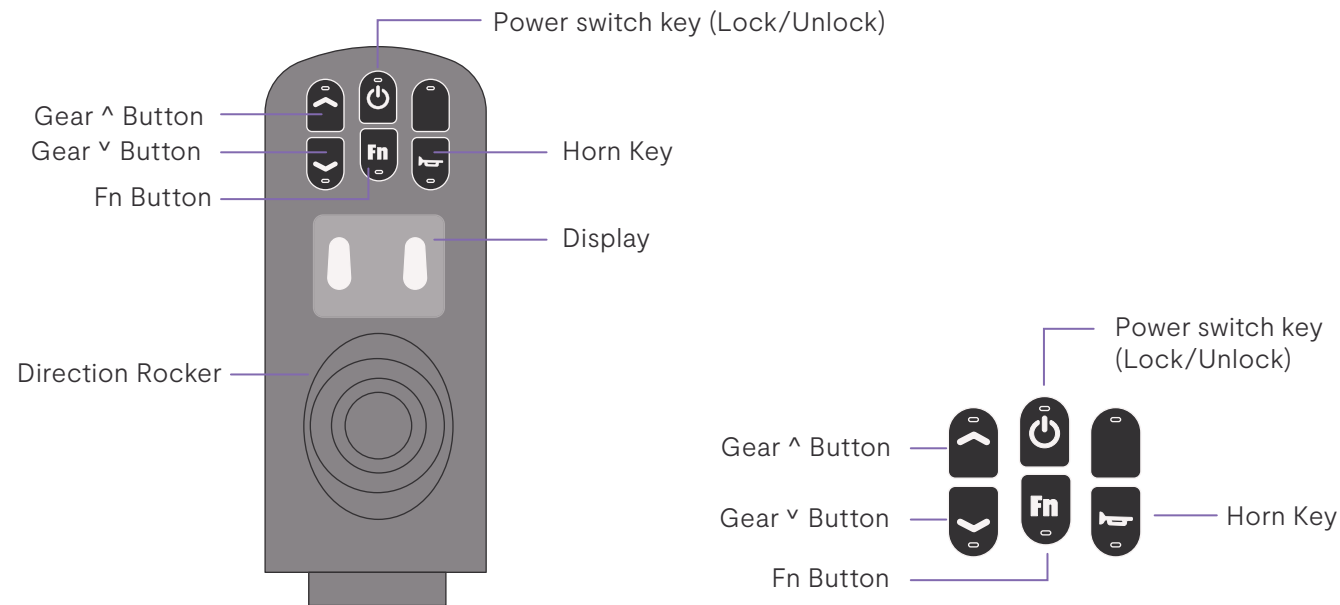


Figure 4.5.2



5.3.1 Operating the Joystick

Joystick

- Push the joystick forward or in any direction to control the speed and movement of the Powerchair.

Power Button

- Press and hold for 3 seconds to turn the power on.
- Press and hold for 3 seconds again to turn the power off.
- Press the power switch once to lock/unlock the Powerchair.

Speed Button Up (^)

- Press “^” to increase the speed setting by one level (maximum level 5)

Speed Button Down (v)

- Press “v” to decrease the speed setting by one level (minimum level 1)

Horn Button

- Press once to activate the horn.

Function (Fn) Button

- Press once to enter Novice Mode. The screen will display gears 1 and 2 along with the NOVICE icon, and a voice prompt will announce “Enter Beginner Mode”. Speed is limited to the first and second levels.
- Press once to exit Novice Mode.

5.3.2 Display Screen

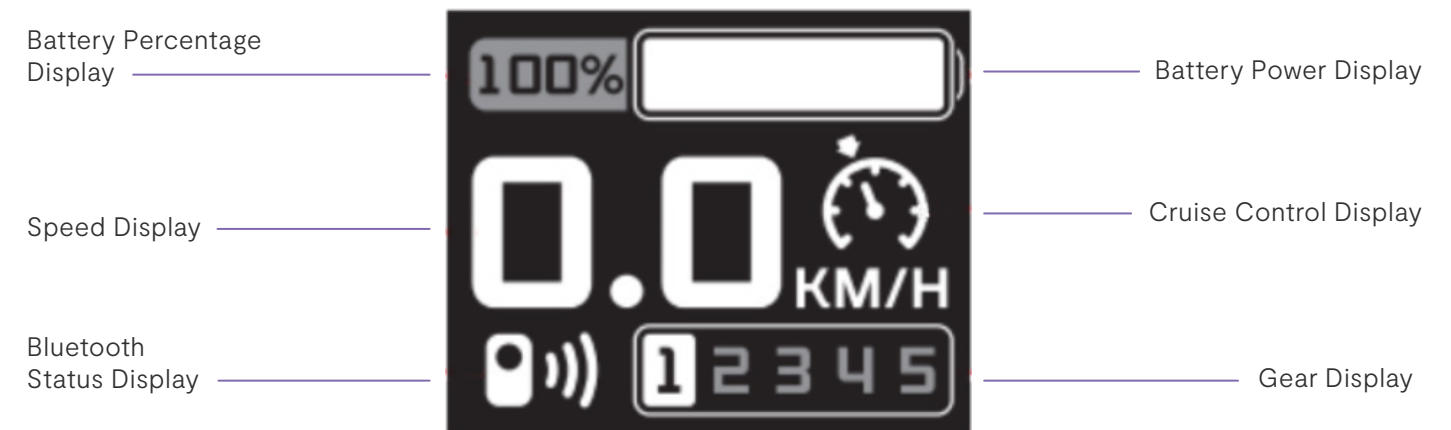


Figure 4.3.3.1

Battery Percentage Display

- The top of the display screen shows the remaining battery level as a percentage (%). (See Figure 4.3.3.1)

Speed Display

- The screen displays the current driving speed of the Powerchair in kilometres per hour (km/h).
- Speed accuracy is within $\pm 5\%$. (See Figure 4.3.3.1)

Bluetooth Status Display

- When Bluetooth is not connected, no Bluetooth icon appears on the screen.
- When Bluetooth is connected, the Bluetooth icon will be displayed. (See Figure 4.3.3.1)

Battery Power Indicator

- The screen continuously displays the real-time power status of the Powerchair. (See Figure 4.3.3.1)

Cruise Control Display

- To activate cruise control, press and hold the “Speed ^” button for more than 3 seconds. The cruise control icon will appear on the display. Push the joystick forward to begin cruise control.
- To exit cruise control, press the lock button or move the joystick backward (this works whether the Powerchair is moving or stationary).
- Note: Cruise control can only be activated when the Powerchair is unlocked. It cannot be used in locked mode.

5.3.3 Push Mode

Press the ‘^’ and ‘v’ keys simultaneously to activate pushing mode. Move the joystick to exit pushing mode (see Figure 4.7).

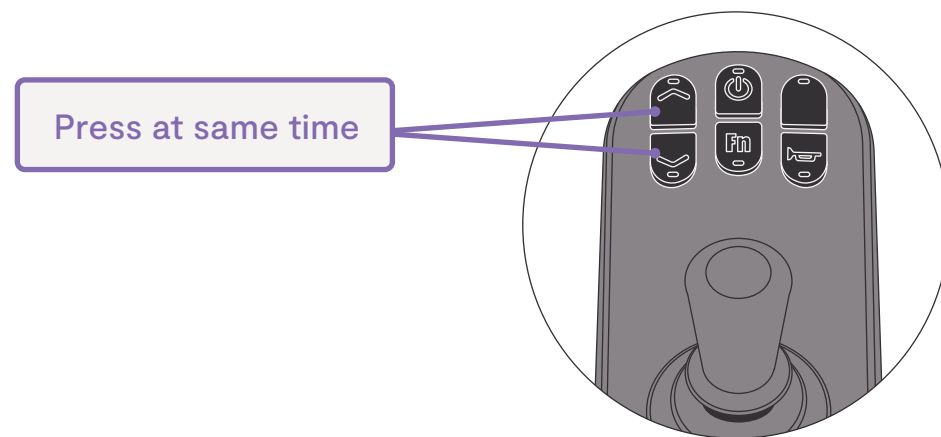
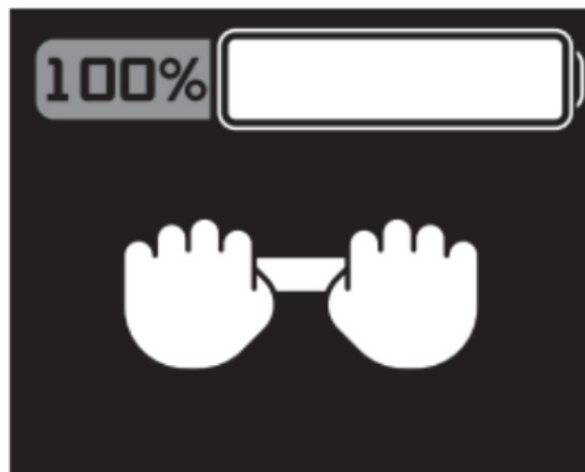


Figure 4.7

The Push Mode icon will be displayed on the display screen



5.4 Adjusting the Armrest Width

The Royal Robooter E60 Powerchair features width-adjustable armrests.

To adjust the width:

1. Locate the two screws underneath each armrest—one in the middle and one at the back.
2. Loosen both screws.
3. Slide the armrest to the desired width.
4. Re-tighten the screws securely to lock the armrest in place.

5.5 Armrest Touch Light & USB Charging

Touch the light switch located on the lower armrest of the left upper control to turn the armrest light on or off (see Figure 4.4.1).

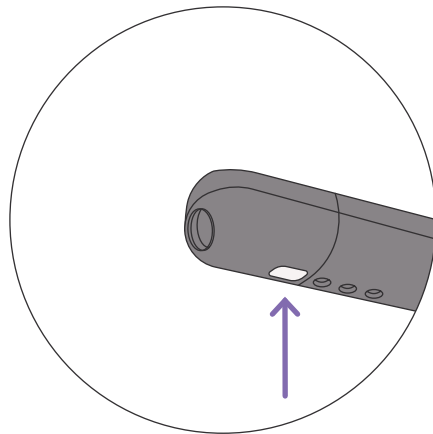


Figure 4.4.1

The armrest touch lamp unit includes two USB charging ports — one USB Type-A and one USB Type-C (see Figure 4.4.2).

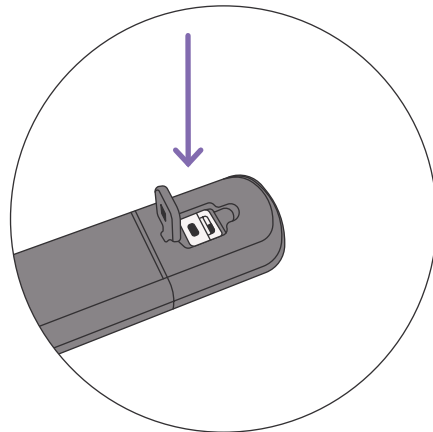


Figure 4.4.2

5.6 Adjusting the Backrest Angle

The Royale Robooter Powerchair features an angle-adjustable backrest. To adjust the backrest angle:

1. Locate the two push pins at the lower end of the backrest—one on each side.
2. Pull each pin outward and rotate it to the side to unlock the backrest.
3. Tilt the backrest to the desired angle.
4. Rotate the pins back into position and ensure they are fully engaged to lock the backrest securely in place.

5.7 Seat belt



Warning

- This product is intended solely for positioning a single individual.
- Seat belts are not suitable for vehicle transportation; this Powerchair is not suitable to use as a seat in a vehicle
- Failure to follow these warnings could result in serious injury or death.
- Ensure that the carer or attendant is properly trained in the correct use of the restraint belts.
- Incorrectly fitted seat belts may cause delays in emergencies and increase the risk of injury.

1. **Fasten the seat belt – insert the tongue into the buckle until a click sound is heard.**
2. **Adjust the length of the seat belt to suit user's requirements**
3. **Removing the seat belt – simply press the clip button and remove the seat belt**

Positioning and adjusting the seat belt

- Adjust the seat belt to fit comfortably and securely, leaving no more than a hand's width of space for both comfort and safety.
- Ensure that when the seat belt is under normal tension, there are no large gaps or loose loops.
- The seat belt should generally be positioned at an angle of approximately 45°. When properly adjusted, it should prevent the user from sliding forward in the seat.

Positioning and adjusting the seat belt

As with all positioning accessories, periodic adjustments may be necessary as the user's seating posture changes over time.

- Regularly inspect the seat belt to ensure it is fitted correctly and continue to provide both safety and comfort for the user.

5.8 Footplate

The footplate on your Powerchair is designed only to support your feet while seated. It is not intended to bear your full body weight.

To ensure safety and prevent damage:

- Do not stand on the footplate when getting into or out of the Powerchair. Standing on it may cause the footplate to bend, break, or detach, leading to injury or damage to the Powerchair. Placing weight on the footplate will cause the Powerchair to tip which may result in serious injury to the user.
- Always fold the footplate up before transferring into or out of the Powerchair.
- When seated, make sure your feet are securely positioned on the footplate to maintain appropriate posture and stability.
- Check the footplate regularly for loose fittings, cracks, or signs of wear, and contact your authorised dealer if any damage is found.



Warning

Standing or applying excessive force on the footplate may result in personal injury or structural damage that is not covered under warranty.

5.8.1 Adjusting the footplate height

Adjusting the height of your Powerchair's footplate helps ensure correct posture, comfort, and safety.

1. **Turn off the Powerchair and ensure stability.**
 - Make sure the power is switched off and the Powerchair is on a flat, stable surface before making any adjustments.
2. **Locate the footplate adjustment screws.**
 - The footplate height is adjusted by loosening the bolts located on the footrest frame
3. **Loosen the adjustment screws.**
 - Loosen the screws completely.
4. **Adjust the height.**
 - Move the footplate to the desired position.
5. **Tighten the screws securely.**
 - Once the footplate is at the correct height, tighten all screws firmly to secure the position
6. **Check clearance and comfort.**
 - Make sure there's enough clearance between the footplate and the ground (at least 40–50 mm).
 - Sit in the Powerchair and confirm your feet are comfortably supported without strain on your legs.



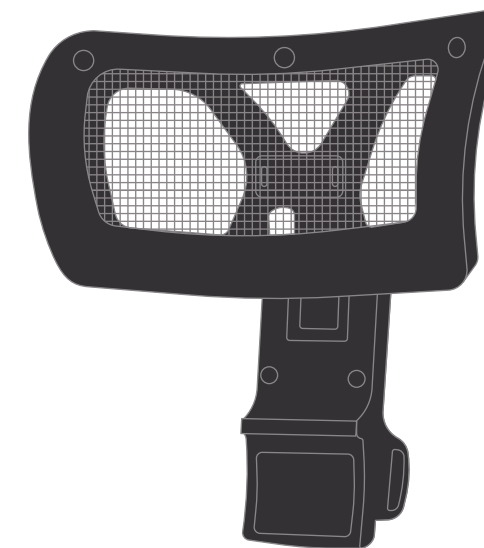
Warning

- Never adjust the footplate while seated in the Powerchair.
- Always ensure the screws are fully tightened before use to prevent the footplate from slipping or becoming unstable.
- Do not stand on the footplate at any time.

5.9 Headrest Accessory

A complementary headrest is supplied with the Powerchair and can be easily installed using the supplied screw fittings.

- To attach, secure the headrest onto the rear push bar.
- The headrest height can be adjusted by gently pushing or pulling the stem to raise or lower it to the desired position.



5.10 Releasing the brakes

To move the Powerchair manually, press down the brake release levers located at the rear, above the anti-tip wheels. This feature is designed for Powerchair attendants and also serves as an emergency freewheel release mechanism.

There are two positions for the rear levers:

1. Drive position – push both left and right levers upwards
2. Freewheel position – push both left and right levers downwards

NB: lock and unlock symbols



Warning

Only release the brake levers when the Powerchair is on a flat surface and the power has been turned off, or in case of an emergency. After manually moving the Powerchair with the brakes released, lift the brake release levers to re-engage and lock the brakes.

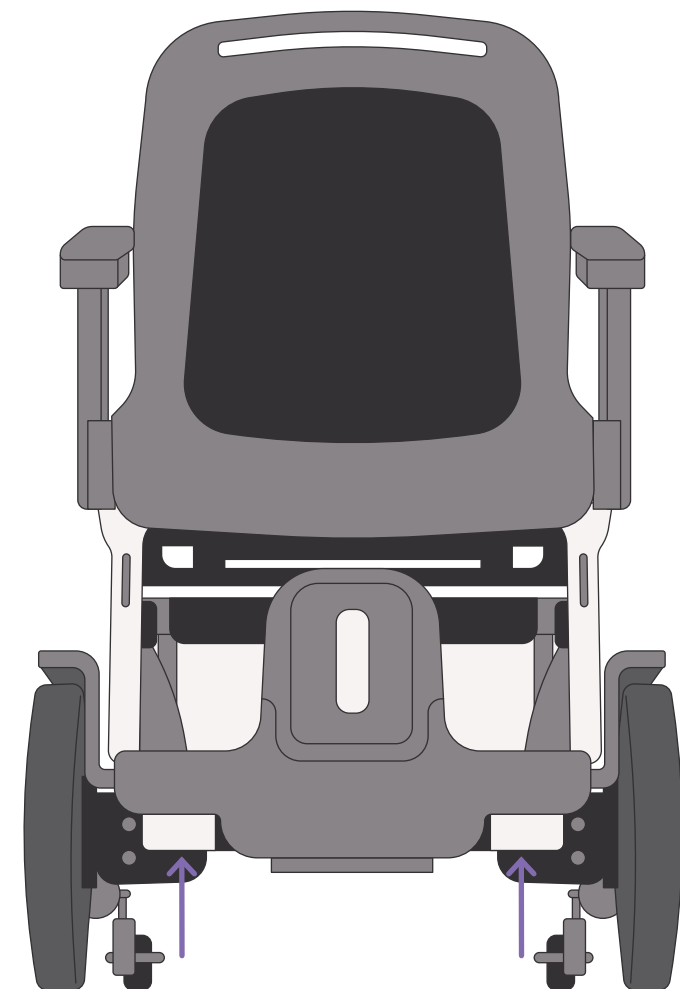
Be aware that when the brakes are released, the Powerchair can move freely, increasing the risk of accidents.

Caution

When moving the Powerchair with the brakes released, push it slowly and carefully by hand.

Since the Powerchair will move freely in this state, pushing too forcefully may cause it to veer unexpectedly. Pushing the device at speeds above 6 km/h may also place stress on the battery, leading to potential malfunction.

Do not operate the brake release levers with your feet, as this may cause them to bend, break, or become inoperable.



5.11 Transporting the Powerchair

5.11.1 Air Transportation

The Royale Robooter Powerchair and the 24V12AH Lithium-Ion battery are recommended for air transport.

Note: Please be advised that airline carriers have varying policies with respect to flying with Lithium-Ion powered items.

ILS recommend the 24V12AH sized lithium battery for any airline travel with your Royale Robooter Powerchair, however, please confirm with your airline carrier prior to arranging travel. The airline carrier ultimately confirms or denies travel of any Lithium device, and specification requirements onboard.

If your airline accepts the Powerchair and the battery, it is recommended to follow the steps below to prepare your Powerchair for air transport:

- Ensure the battery charge does not exceed 30%. Refer to battery indicator on display screen.
- Disconnect the battery from compartment.
- Fold the powerchair.
- Pack the Powerchair carefully in its original packaging or with the travel bag accessory for safe transport.

5.11.2 Vehicle Transportation

This Powerchair is not suitable to use as a seat in a motor vehicle.

5.11.3 Using your Powerchair on the Train

Before travelling by train, please contact the train operator for information on any specific requirements or instructions. It is recommended to confirm the following before your journey:

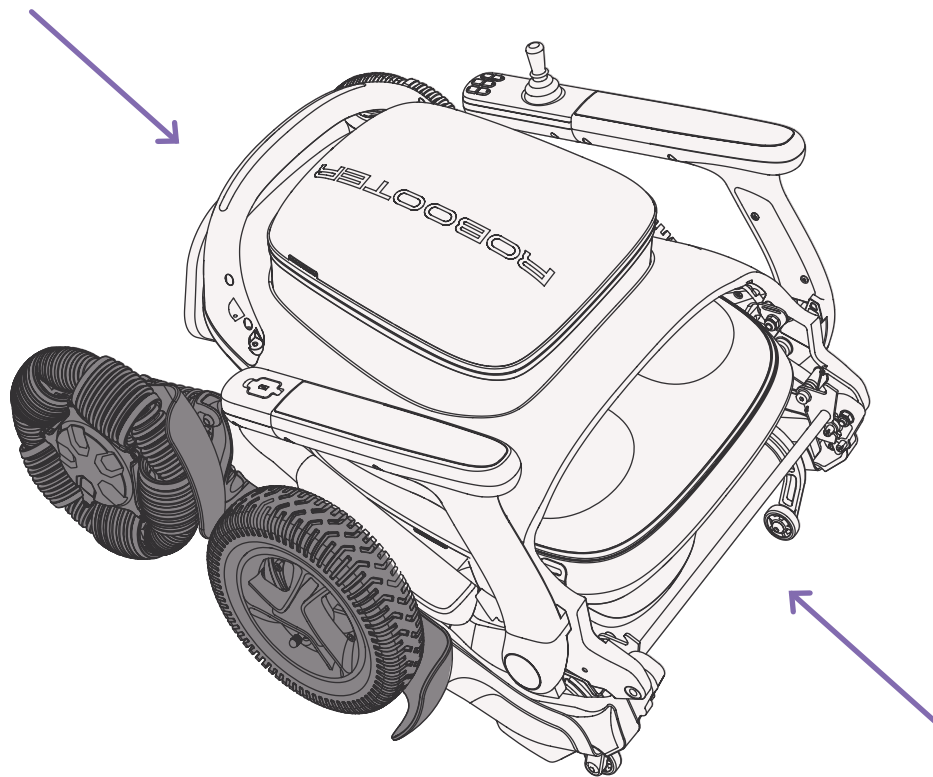
- Whether there is a designated Powerchair/Wheelchair area on the train with adequate turning space for safe manoeuvring.
- Whether there is a suitable or marked area on the platform for Powerchair/Wheelchair users, also allowing sufficient space to manoeuvre.
- That boarding access is suitable for both entering the train carriage and reaching the designated Powerchair/Wheelchair area.
- That the boarding ramp or lift can safely support the combined weight of the Powerchair and occupant.
- That the slope of the boarding access does not exceed the Powerchair's maximum safe gradient.
- That any obstacles or thresholds on the platform or train do not exceed the Powerchairs maximum kerb-climbing height.

Most train operators can aid with Powerchair users, but this usually needs to be arranged in advance.

We recommend keeping your Owner's Manual available when planning your trip and when contacting the train operator.

5.11.4 Folding & Wheeling the Powerchair

To manually fold the Powerchair (Refer to 5.1). Once folded, the user can simply wheel the Powerchair using the rear roller wheels. The footplate has a handle insert to assist with pulling.



5.11.5 Transporting Personal Belongings

Storage Basket

Use the storage basket to carry personal items. Do not place objects on the armrests, as this may cause damage or deformation to the arms or armrests.

The maximum load capacity of the storage basket is 5 kg. Exceeding this limit may result in damage to the basket.



Caution

Observe the following precautions when using the storage basket, as failure to do so may lead to accidents:

- Ensure that stored items do not extend beyond the sides of the basket.
- Turn off the Powerchair and check your surroundings for safety before placing or removing items.
- Ensure all items are removed from the storage basket when folding the Powerchair.

Rear Backpack

Use the rear backpack to carry personal items.

The maximum load capacity of the backpack is 5 kg. Exceeding this limit may result in damage to the backpack.

- Ensure that stored items do not extend beyond the size of the backpack.
- Close and secure the backpack using the zippers.

5.12 Bluetooth Attendant Controller

The Bluetooth Attendant Controller offers an alternative control method, but it must not replace safe user practices. Always follow the normal operational guidelines of the Powerchair and ensure that the attendant controller is used responsibly and in tandem with a trained attendant. Please note, attendant controller requires 2 x AAA batteries.



1. Prepare the Powerchair

- Make sure the Powerchair is turned off.
- Ensure the battery is charged or connected, and the powerchair is in a stable, flat location.

2. Power On the Powerchair

- Turn on the Powerchair joystick so that the upper controller display becomes active.
- Press the power button to ensure the Powerchair is 'Unlocked'.

3. Hold the Bluetooth attendant controller next to the joystick

- Whilst holding the Bluetooth attendant controller close to the joystick, press the power on button on the Bluetooth remote.

4. Confirm connection by looking at the Bluetooth status display on the display screen

- With Bluetooth connection, the Bluetooth sign is displayed on the screen
- Without Bluetooth connection, the Bluetooth sign is not displayed on the screen

5. Test the connection

- Ensure that the handset and Powerchair joystick both respond appropriately when commanded.
- Make sure your user and attendant both understand how the attendant controller works.
- Always keep the original joystick controller accessible in case you need to switch back to user control.

6. Troubleshooting & Safety Notes

- If pairing fails, turn both the Powerchair and attendant controller off, wait 10 seconds, then turn them on and repeat the pairing process.
- Do not rely solely on the attendant controller in unknown environments — ensure you have adequate control and familiarity before active use.
- Ensure the attendant is trained in how to safely operate the Powerchair using the controller, especially in crowded or moving environments.
- For advanced settings or issues beyond pairing, contact your local authorised dealer.

5.13 Bluetooth Control Via Downloadable APP

The Bluetooth Attendant Controller offers an alternative control method, but it must not replace safe user practices. Always follow the normal operational guidelines of the Powerchair and ensure that the attendant controller is used responsibly and in tandem with a trained attendant.

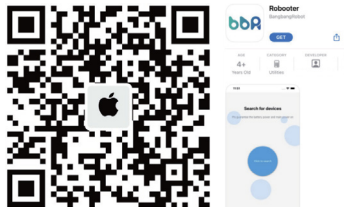
1. Downloading the APP

App can be installed on either Android or IOS. Download the app.

Scan the QR Code to download the mobile application.

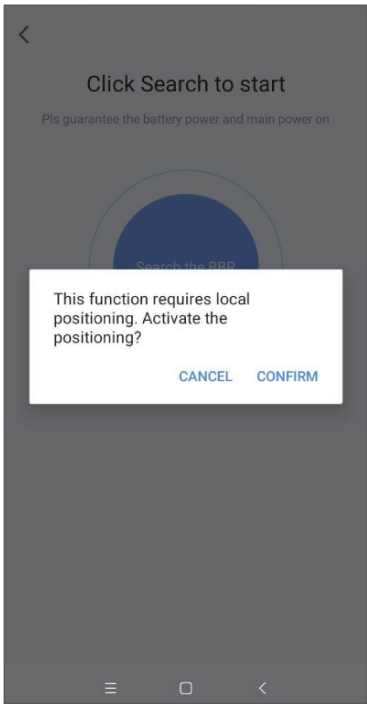


Android

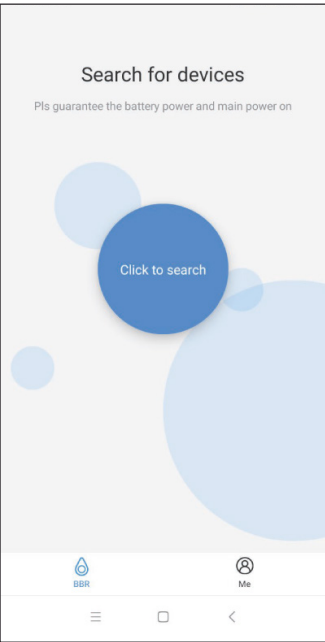


IOS

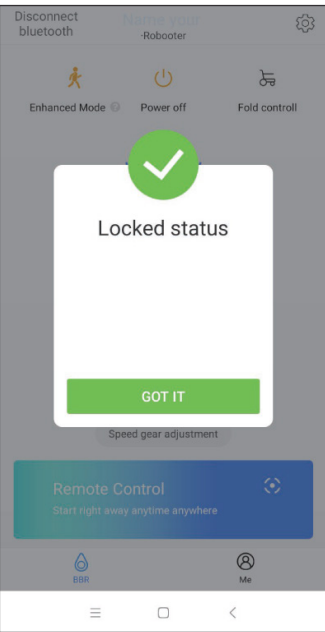
- 2. Ensure mobile Bluetooth is turned on and ‘allowed’ for pairing with this app
- 3. Ensure mobile local positioning is turned on and ‘allowed’ for pairing with this app



- 4. Once these permissions with the mobile have been completed, turn on the powerchair and click to search.

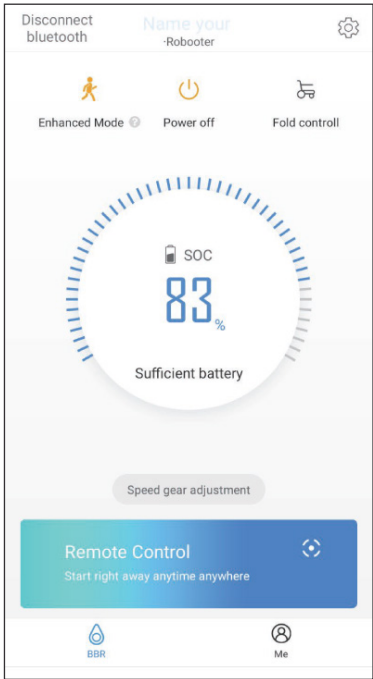


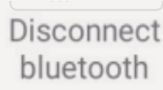
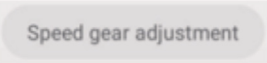
- 5. The below screen indicates a successful connection. Click Got it.



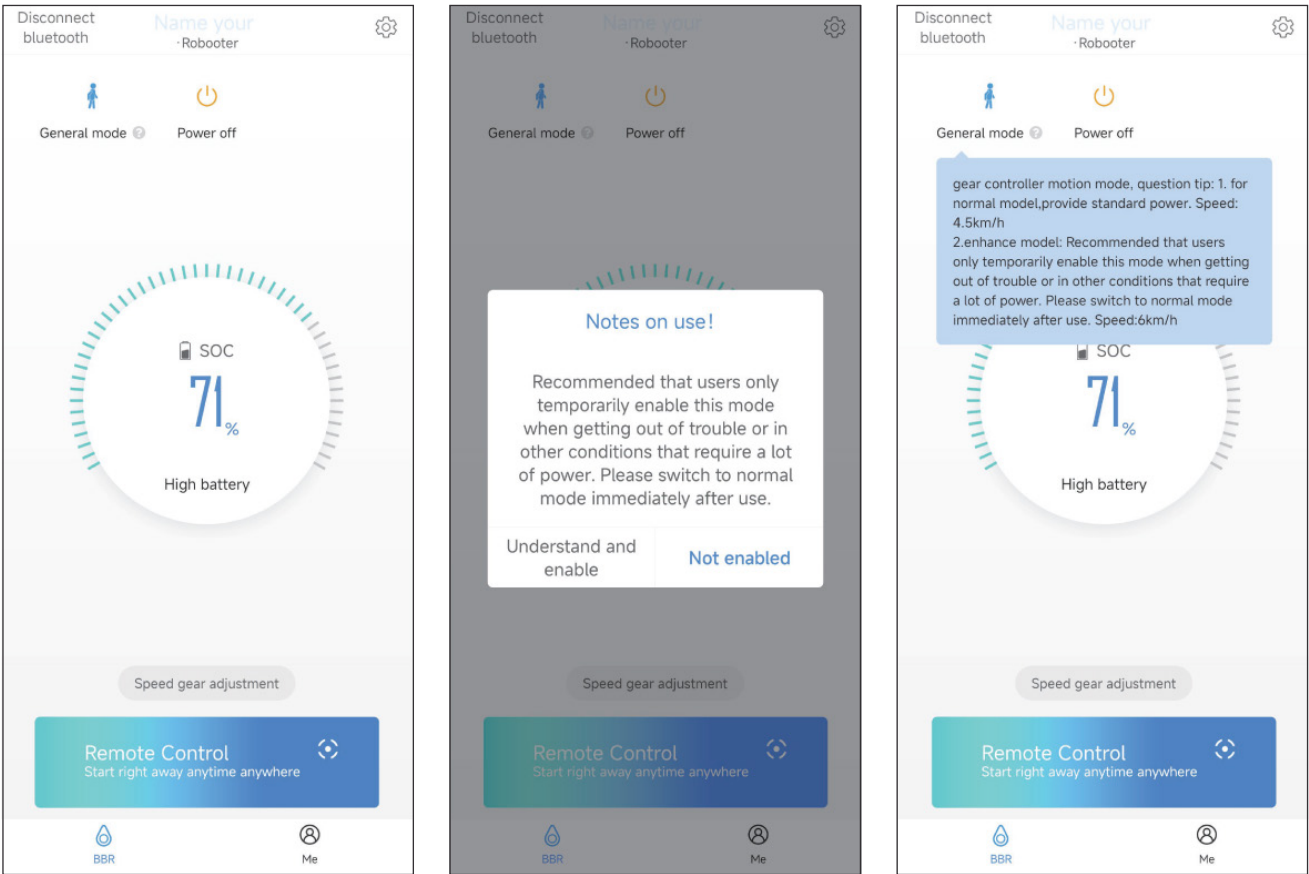
6. Viewing the screen

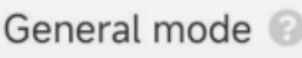
The below screen will appear



	Click to turn off the device
	Click to disconnect the Bluetooth connection
	Click to adjust the speed please note; only can be done when the joystick is unlocked

7. App operation guide



	Click to access enhanced mode adjustment and general mode adjustment
	NB: General mode speed: 4.5km/h, Enhanced mode speed: 6km/h

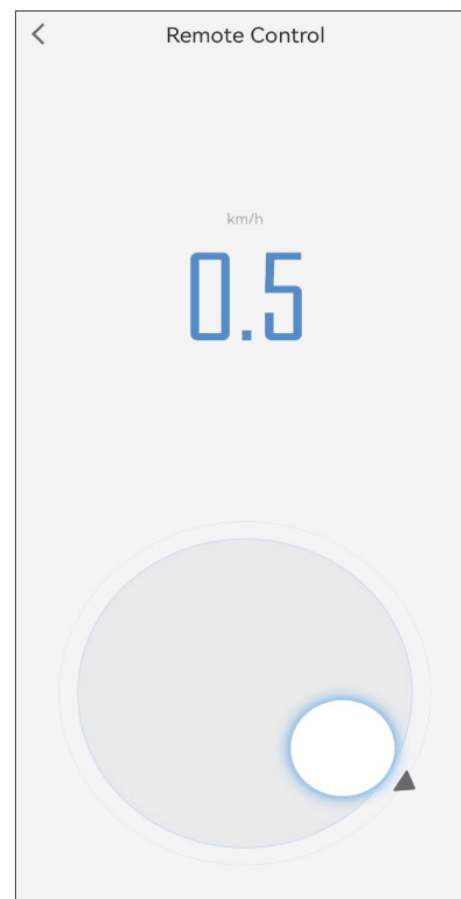
8. Accessing joystick control

Please note, the joystick must be locked to allow Bluetooth operation

Click Remote Control

This will allow the attendant to access the remote control.

- Circle up – forwards
- Circle down – backwards
- Circle left – turn left
- Circle right – turn right

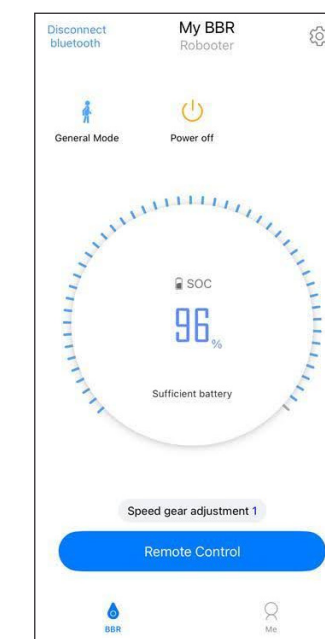


9. Adjusting the speed

Please note, the joystick must be unlocked to allow Bluetooth speed gear adjustment

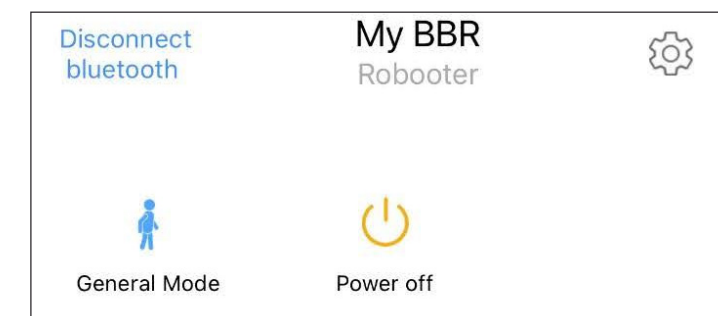
Click Speed Gear Adjustment 1

- Allows speed adjustment between levels 1 – 5



10. Accessing settings

Click 



Here within the settings, users can access the following:

- General Settings
- Battery Information
- Current Version

11. General Settings
Voice Settings

<

Voice Settings

Turn on voice prompts

☒

Turn on voice alarm

☒

Volume

High

☒

Middle

☐

Low

☐

Standby Time

<

Standby time

Off

☐

10Min

☐

20Min

☐

30Min

☒

40Min

☐

50Min

☐

60Min

☐

Language Settings
Choose up to 10 languages

<

Language settings

English

☒

French

☐

Italian

☐

Spanish

☐

Korean

☐

Japanese

☐

German

☐

Portuguese

☐

Russian

☐

Chinese

☐

Battery Light Brightness
This adjusts the brightness of the lithium battery

<

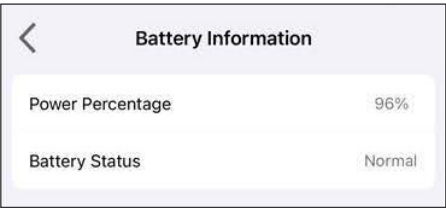
Battery light brightness

Adjust the brightness of the light, which can be selected at 0%, 25%, 50%, 75%, and 100% brightness (default brightness is 100%)

0

100

12. Battery Information



13. Current Version

This is where users check for app updates.

Click check for update



14. Operation Characteristics of Bluetooth Control Via Downloadable APP

Bluetooth Specifications	
Protocol	4.1
Frequency Band	2.4 GHz ISM band
Operating Frequency	2.400 GHz – 2.4835 GHz
Modulation Type	GFSK
Spread Spectrum Technology	Frequency Hopping
Output Power	+4dBm~-20dBm (in 4dB steps)
Receiver Sensitivity	-93 dBm (in BLE mode)
Operating Range	Up to 10 m

5.13.1 Security Measures

At the application layer, AES-128 encryption is used by the hardware to re-encrypt all interactive data. The 128-bit initial password is generated using the unique feature codes of both connected devices and is continuously updated and synchronized throughout the connection process.

Because the data includes dynamic random codes and sequence identifiers, the structure of each communication packet changes with every transmission. The actual data becomes readable only after successful decryption.

If incorrect data or invalid authentication attempts occur repeatedly, the connection will automatically terminate, and the offending device will be added to a blacklist until the restriction is lifted. This ensures secure and reliable signal transmission.

**Warning**

If the mobile phone fails to control the Powerchair properly, stop using the phone immediately and operate the Powerchair using its onboard controls.

Remove any nearby wireless devices that may cause interference, then reconnect your mobile phone to the Powerchair and test the controls again.

Do not resume using the mobile phone until it can reliably and accurately control the Powerchair.

NB: When operating the Powerchair via mobile phone, ensure that other wireless devices are kept at least 2 metres away from the Powerchair to avoid interference.

Labelling Information 6

5.13.2 Compliance

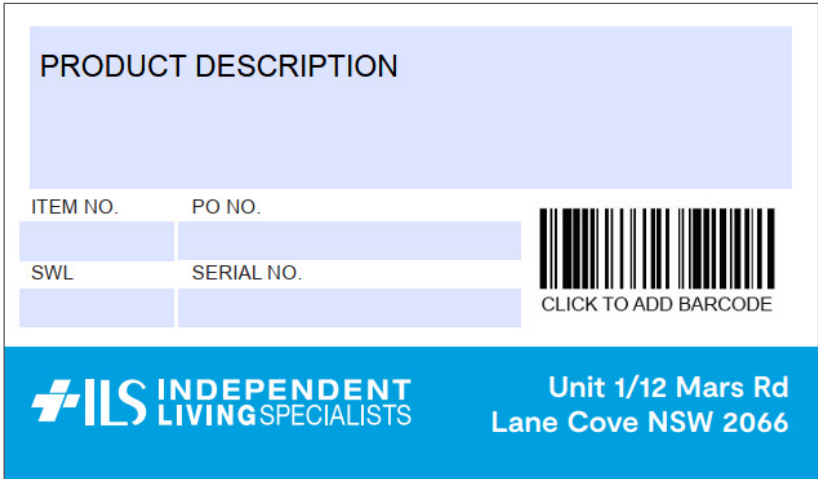
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1. The device must not cause harmful interference.
- 2. The device must accept any interference received, including interference that may result in undesired operation.

5.14 Other Safety Warnings

- Avoid using the device in environments with high levels of electromagnetic (EM) interference.
- Do not operate the device if its performance is affected or degraded by EM disturbances. Using accessories or cables not specified or provided by the manufacturer may increase electromagnetic emissions, reduce immunity, and cause improper operation.
- Avoid operating the device in close proximity to other equipment, as this may lead to malfunction. If simultaneous use is necessary, monitor both devices to ensure they are functioning correctly.
- Portable RF communication equipment (including peripherals such as antenna cables and external antennas) must be kept at least 30 cm (12 inches) away from any part of the device, including manufacturer-specified cables. Failure to do so may result in performance degradation.
- WARNING: Common RF sources such as RFID readers, electronic security systems (e.g., metal detectors, article surveillance), NFC systems, wireless power transfer (WPT) devices, or medical equipment such as electrocautery, MRI, diathermy, and electrosurgical units may cause electromagnetic interference (EMI). Maintain as much distance as possible from these devices during use.

The device has a product label. The product label includes the following information:

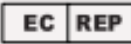


- Name and address of the company
- Name and code for the product
- Safe Working Load (SWL)
- Serial number of the product (which includes the date of manufacture and the batch serial number)

Product Care & Maintenance

7

The symbols below may be found in this user manual or the labels on the Powerchair.

	Manufacturer Indicates manufacturer of the medical device.
	Date of Manufacture. Indicates the date when the medical device was manufactured.
	Authorized representative in the European community/European Union Indicates the authorized representative in the European community/European Union
	CE Marking of Conformity The CE marking shall consist of the initials ‘CE’ taking the form according to Medical Device Annex EU Regulation 2017/745.
	Serial Number Indicates the manufacturer’s serial number so that a specific medical device can be identified.
	Batch Code Indicates the manufacturer’s batch code so that the batch or lot can be identified.
	Medical Device Indicates the item is a medical device.
	The first X represents the lack of testing for solid objects, while the second X indicates the waterproof level of the device.
	Indicates separate collection for waste of electrical and electronic equipment (WEEE).
	Maximum number of identical transport packages/items which may be stacked on the bottom package, where “n” is the limiting number.
	This is the correct upright position of the distribution packages for transport and/or storage.
	Distribution packages shall be kept away from rain and be kept in dry conditions.
	Contents of the distribution package are fragile, therefore it shall be handled with care.

The lifespan of your Powerchair depends greatly on appropriate maintenance and care.

For details regarding specific adjustments, maintenance, or repair services, please contact your authorised Royale Medical dealer. When doing so, always provide the model, year of manufacture, and the serial number found on the product label.

 **Caution**

It is recommended that your Powerchair is serviced by an authorised Royale Medical dealer at least once a year, or every six months if it is used intensively.

To find a list of approved dealers in your area, please contact your Royale Medical Dealer.

7.1 Maintenance



Loose fasteners should be tightened according to the installation instructions.

- Replace seat belt immediately if any signs of damage or excessive wear are noticed.
- If any broken or loose components are found, stop using the Powerchair immediately and contact your authorised Royale Medical dealer for replacement parts.
- Check all components and mechanisms to ensure they adhere properly when pressed together.
- Remove any debris, such as fluff or hair, from components, as this can reduce their holding strength.

If you have any concerns or uncertainties about your Powerchair's performance requirements, please contact your authorised Royale Medical dealer for guidance.

- After carrying out any maintenance or repairs, always ensure the Powerchair is operating correctly before use.
- All fasteners must be replaced with identical parts that match the original length, tensile strength, and material specifications.
- When replacing self-locking nuts or fasteners that use a thread-locking compound, make sure to reapply an appropriate thread-locking solution before installation.

7.2 Daily Checks Before Use

Perform the following routine checks before operating the Powerchair each day:



Checking front and rear wheels

- Ensure that all wheels are securely fastened.

Checking the battery

- Before using your Powerchair for the first time, charge the batteries to 100%.
- Check that the batteries are adequately charged — the green lights on the battery indicator should be illuminated.

Checking the joystick

- With the power switched off, check that the joystick is straight and undamaged, and that it returns smoothly to the centre position when pushed and released.

Checking the freewheel lever

- Make sure the freewheel lever is set to the “drive” position.

Checking the seat and backrest

- Ensure that the seat cushion is properly positioned and secure.
- Visually inspect the Powerchair to confirm that the footplate, armrests, and other components are correctly attached and firmly fastened.

Checking for clothing entrapment risk

- When operating the Powerchair, make sure your clothing does not interfere with its movement (e.g. garments that are too long).
- Before use, check that your clothing and accessories are clear of the wheels and any other moving or rotating parts where they could become caught or entangled.

Checking weather conditions

- In cold weather, battery performance decreases. During mild frost, capacity drops to about 75% of normal, and at temperatures below -5°C, it may reduce to around 50%. This will limit the Powerchair's driving range.
- Ensure operation is within environmental temperature requirements
- Plan trips prior to avoid exposure to wet weather



Warning

Avoid wearing loose sleeves or cuffs while operating the joystick, as they may become caught and interfere with safe operation.



Warning

If the footplate comes into contact with the ground during use, it may cause the front edge to become sharp and potentially lead to injury. Handle it with caution and replace the footrest immediately if any sharp edges develop.

7.3 Weekly Checks

Carry out the following weekly inspection routine before operating the Powerchair:

Checking Joystick & cable

- Ensure that all connectors are properly and securely connected.
- Verify that all cables are firmly attached to the Powerchair and not loose.
- Inspect all cables and connectors for any signs of wear, fraying, or damage.

Checking joystick controller

- Ensure that all components of the joystick are securely mounted. Avoid over-tightening any screws during inspection or adjustment.
- Test all electrical functions, including lights to ensure they are operating correctly.
- Drive the Powerchair in each available drive profile to verify that performance remains consistent with normal operation.
- Refer to section on trouble shooting if required.

Checking the front and rear wheels

When checking the wheels for wear, inspect them for deep scuff marks, cuts, or a noticeable reduction in tread depth. The wheels are recommended to be replaced once the tread is no longer visible across the entire surface of the tyre.



Warning

- If you have any concerns or uncertainties about your Powerchair's performance requirements, contact your authorised Royale Medical dealer for assistance.
- After completing any maintenance or repair work, always ensure the Powerchair is operating correctly before use.
- A comprehensive inspection, safety check, and service must be carried out by an authorised Royale Medical dealer at least once per year.
- Replace all fasteners with identical parts that match the original length, tensile strength, and material specifications.
- When replacing self-locking nuts or fasteners secured with a thread-locking compound, reapply a suitable thread-locking solution during reassembly.
- Remove any debris, such as fluff or hair, from components, as contamination can reduce strength.

7.4 Monthly Checks

Carry out the following monthly inspection before operating the Powerchair:

- Inspect all fasteners for signs of wear, including loose bolts or damaged components.
- Examine all straps for fraying, torn seams, or any other signs of excessive wear. Stop using the Powerchair immediately if any damage is detected.

7.5 Cleaning

It is recommended to wipe the Powerchair once a week using a slightly damp (not wet) cloth and remove any dust or debris that has collected around the motors by gently blowing or brushing it away.

Ensure that all parts of the Powerchair are thoroughly dried if they become wet or damp after cleaning, or if the Powerchair has been used in a humid or wet environment.



Caution

- Do not use solvents, bleach, abrasive cleaners, synthetic detergents, wax polishes, or aerosol products. Disinfectants may be used, but only when diluted according to the manufacturer's instructions.
- After cleaning, wipe all surfaces thoroughly with a clean damp cloth and ensure they are completely dry
- Always read the label on any commercial or household cleaning product before use.
- Always follow the manufacturer's cleaning instructions carefully at all times.

7.6 Storage

When storing your Powerchair for an extended period (longer than one week), follow these steps:

- Fully charge the Powerchair.
- Disconnect the charger once charging is complete.
- Disconnect the batteries to prevent power drain during storage.



Warning

Never store your Powerchair:

- Outdoors
- In direct sunlight (as plastic parts may fade or discolour)
- Near any direct heat source.
- In damp or humid environments.
- In extremely cold conditions.
- With the batteries or battery boxes connected, even if the controller is switched off.

Avoiding these conditions will help prevent deep battery discharge and extend the overall battery lifespan.

When bringing the Powerchair back into use, reconnect the batteries or battery boxes and charge the Powerchair fully before operation.

Recommended Storage Temperature:

- Temperature range: **-10°C to 50°C**
- Relative humidity: **not exceeding 95%**

8 Recycling & Disposal

Please follow the local government rules regarding proper recycling and disposal. Recycling and disposal should always be done through an authorised agent or licensed place of disposal. Please review the list of Powerchair parts and packaging materials to ensure they are recycled or disposed of correctly.

- Frame – Aluminium, steel and plastic
- Wheels – Polyurethane
- Motors – Aluminium, steel and copper
- Seat – Polyurethane
- Packaging – Cardboard carton and plastic
- Battery – Lithium-Ion

Please follow the local government rules in regard to the proper disposal and recycling.

Trouble Shooting 9

If the Powerchair is not functioning properly, review the following checklist:

- Ensure the batteries are fully charged.
- Turn the Powerchair off, then switch it back on.
- Confirm that all battery connectors are securely plugged in, including the battery into the designated port.
- Check that the freewheel lever is set to the DRIVE position.
- Verify that the controller is not locked.

Warranty

10

Fault Code	Anomaly Status	Fault Phenomenon
E1	Key abnormality	The key corresponding function does not work.
20	The rocker ground line is disconnected	The rocker function does not work.
21	The rocker power cord is disconnected	The rocker function does not work.
22	The rocker X-axis is disconnected	The rocker function does not work.
23	The rocker Y-axis is disconnected	The rocker function does not work.
24	The rocker is a non-zero start	The rocker function does not work.
E6	CAN communication is abnormal	The rocker cannot control the driving of the electric wheelchair.
E7	FLASH fault	FLASH device ID cannot be detected and the device cannot work.
82	Left motor Hall fault	The left motor Hall is not connected or faulty, and the motor does not function.
81	Right motor Hall fault	The right motor Hall is not connected or faulty, and the motor does not function.
40	Flat in the electromagnetic brake of left motor	To release the electromagnetic brake handle of left motor, close the electromagnetic brake.
41	Flat in the electromagnetic brake of right motor	To release the electromagnetic brake handle of right motor, close the electromagnetic brake.
80	Low voltage fault	The motor cannot run.
88	Pre-charge fault	The motor cannot run.
84	Short-circuit fault of lower gear MOS in the right motor	The motor cannot run.
85	Short-circuit fault of upper gear MOS in the right motor	The motor cannot run.
86	Short-circuit fault of upper gear MOS in the left motor	The motor cannot run.
87	Short-circuit fault of lower gear MOS in the left motor	The motor cannot run.
90	High voltage fault	After detecting the high pressure before starting, keep it locked.
91	The left motor phase loss and disconnection fault	The motor cannot run.
92	The right motor is out of phase and disconnected	The motor cannot run.
93	The left motor and right motor are out of phase and disconnected	The motor cannot run.
94	The right motor stall	The motor cannot run.
95	The left motor stall	The motor cannot run.
96	Left and right motors are stuck	The motor cannot run.

Warranty Coverage

If any part of this product requires repair or replacement due to a manufacturing or material defect within 18 months of purchase, the affected component(s) will be repaired or replaced free of charge.

- This warranty covers **manufacturing defects only**.

How to Make a Warranty Claim

To make a warranty claim, please contact the authorised dealer from whom you purchased your Powerchair.

All warranty repairs must be carried out by an authorised dealer.

Repaired or Replaced Parts

Any part repaired or replaced under this warranty will remain covered for the remainder of the original warranty period for the product, as outlined in ‘Warranty Coverage’.

Batteries

The batteries supplied with this product are covered under the manufacturer’s warranty for a period of 12 months from the date of purchase. This warranty covers defects in materials or workmanship.

The warranty applies only when the batteries have been used, charged, and stored in accordance with the instructions provided in this manual.

Batteries must be charged using the approved charger supplied.

The warranty becomes void if the batteries are damaged due to:

- Improper charging or use of non-approved chargers.
- Over-discharge or neglect (e.g., leaving batteries uncharged for extended periods).
- Exposure to extreme temperatures, fire, or water.
- Physical damage or tampering.

Refer to 5.2.1 section for battery information and manufacturers recommendations.

Warranty on Purchased Spare Parts

Genuine spare parts fitted at the customer’s expense are covered by a 12-month warranty from the date of fitting, under these same warranty conditions.

Battery Material Safety Data Sheet (MSDS)

11

Warranty Exclusions

This warranty does not cover repairs or replacements required as a result of:

- Normal wear and tear (including but not limited to batteries, armrest pads, upholstery, wheels, etc.).
- Overloading the product beyond its maximum user weight (refer to the product label).
- Failure to maintain or service the product as recommended in the user or service manual.
- Use of accessories not approved or supplied as original parts.
- Damage caused by neglect, accident, misuse, or improper handling.
- Modifications or alterations that deviate from the manufacturer’s specifications.
- Repairs undertaken without prior authorisation from ILS Customer Service.

Governing Law

This warranty is subject to the laws of the country in which the product was originally purchased.

Product Life Expectancy

The estimated life expectancy of this product is five years, provided that:

- It is used strictly in accordance with the intended use described in this manual.
- All maintenance and service requirements are completed as recommended.

With proper care and maintenance, this lifespan may be extended. However, extreme or incorrect usage can significantly reduce it.

- The stated life expectancy is an estimate only and does not constitute an additional warranty.

If you have any questions regarding the use, maintenance, or safety of your Powerchair, please contact your local authorised Royale Medical dealer.

If you are unsure of an approved dealer in your area or have additional inquiries, please contact us by phone or in writing at the details below:

Independent Living Specialists Pty Ltd

Unit 1/12 Mars Road, Lane Cove, 2066, NSW

Phone: 1300 008 267

www.ilsau.com.au

11.1 12AH Battery MSDS



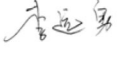
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Material Safety Data Sheet

MSDS 报告

MSDS Report

申请商: Prepared For:	上海邦邦机器人有限公司 Shanghai Bangbang Robotics Co.,Ltd.		
地址: Address:	上海市松江区中辰路 188 号 3 幢 501 室 Room 501, Building 3, No.188 Zhongchen Road, Songjiang District, Shanghai		
产品名称: Product Name:	锂离子电池 Lithium-ion battery		
型号: Model:	LY-BT-07		
标称电压: Nominal Voltage:	24V		
额定容量: Rated Capacity:	12Ah, 288Wh		
质量: Weight:	Approx(约). 2462.8g		
尺寸: Dimension:	70mm×103mm×154mm (T×W×L)		
编制单位: Prepared By:	深圳诚测检测技术有限公司 Shenzhen CCJC Technology Co.,Ltd. 广东省深圳市宝安区沙井街道后亭社区沙松路135-3号101(1-3层) 1-3/F, Building 101, No.135-3, Shasong Road, Houting, Shajing Street, Bao'an District, Shenzhen, Guangdong, China		
报告编号: Report No.:	CCJC2023A550404	检验日期: Inspection Date:	2023-11-01
签发日期: Issue date:	2023-11-01	生效日期: Effective Date	2024-01-01
编制 Compiler:		审核 Checker:	
		批准 Approver:	

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Add:1-3/F, Building 101, No.135-3, Shasong Road, Houting, Shajing Street, Bao'an District, Shenzhen, Guangdong, China



Material Safety Data Sheet

第一部分 化学品及企业标识
Section 1 - Chemical Product and Company Identification

产品名称: Product Name:	锂离子电池 Lithium-ion battery
产品型号: Product Model:	LY-BT-07
制造商: Manufacture:	安徽超锂电子科技有限公司 Anhui Chaoli Electronic Technology Co., Ltd.
地址: Address:	安徽省蚌埠市五河县城南中小产业园 19 号 No. 19, Chengnan middle and small industrial park, Wuhe County, Bengbu, Anhui
电话: Tel:	+86-512-63032237
传真: Fax:	/
应急电话: Emergency Tel:	+86-512-63032237
邮箱: E-mail:	fredque@163.com

第二部分 危险性概述
Section 2 - Hazards Identification

危险性类别 Classification of Danger	见第十四部分。 See section 14.
侵入途径 Primary Route(s) of Exposure	眼睛，皮肤接触，摄入。 Eye, skin contact, ingestion.
健康危害 Health Hazard	正常条件下根据制造商的说明使用电池不会产生危害。使用不当的情况下，有破裂、起火、发烫、内部成分泄漏的危险，并可能造成意外损失。使用不当的行为包括但不限于下列情况：长时间充电、短路、投入火中、硬物撞击、尖物刺破、破碎，和破裂。 The batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's risk of rupture, fire, heat, leakage of internal components, with could cause casualty loss. Abuses include but not limited to the following cases: charged for long time, short circuited, put into fire, whacked with hard object, punctured with acute object, crushed, and broken.

第三部分 成分/组成信息
Section 3 – Composition/Information on Ingredients

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

Tel: (86-755)23707853 Http: //www.ccjctek.com Email: lab@ccjctek.com
Add:1-3/F, Building 101, No.135-3, Shasong Road, Houting, Shajing Street, Bao'an District, Shenzhen, Guangdong, China



化学名称 Chemical Composition	CAS 编号 CAS No.	浓度或浓度范围(%) Concentration or concentration ranges (%)
钴酸锂 Lithium Cobalt Oxide	12190-79-3	37.82
聚偏氟乙烯 Polyvinylidene Fluoride(PVDF)	24937-79-9	1.46
铝 Aluminum(Al)	7429-90-5	9.03
石墨 Graphite	7782-42-5	16.48
丁苯橡胶 Styrene-Butadiene Rubber (SBR)	61789-96-6	0.39
羧甲基纤维素 Carboxymethylcellulose	9000-11-7	0.31
铜 Copper (Cu)	7440-50-8	9.74
镍 Nickel (Ni)	7440-02-0	1.08
六氟磷酸锂 Lithium Hexafluorophosphate	21324-40-3	18.56
聚乙烯 Polyethylene	9002-88-4	3.03
尼龙 Nylon	24937-16-4	0.8
聚丙烯 Polypropylene	9003-07-0	1.3

标签根据EC指令。
Labeling according to EC directives.

不需要象形符号和危险短语。
No symbol and risk phrase are required.

注意: CAS 号是化学文摘服务注册号码。
Note: CAS number is Chemical Abstract Service Registry Number.

N/A =不适用。
N/A=Not apply.

第四部分 急救措施
Section 4 - First Aid Measures

眼睛 Eye	万一接触，立即用大量的清水冲洗至少15分钟，翻起上下眼睑，直到化学的残留物消失为止，迅速就医。 Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
皮肤 Skin	万一接触，用大量水冲洗至少15分钟，同时除去污染的衣物和鞋子，迅速就医。 Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

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吸入 <i>Inhalation</i>	立即从暴露处移至空气清新处，如果呼吸困难给予输氧，立即就医。 Remove from exposure and move to fresh air immediately. Use oxygen if available.
食入 <i>Ingestion</i>	饮用至少两杯牛奶或水。如果当事人仍然清醒可以采取催吐的方法，并且立即就医。 Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

第五部分 消防措施
Section 5 - Fire Fighting Measures

危险特性 <i>Characteristics of Hazard</i>	高密度粉尘遇空气会形成爆炸性混合物。燃烧生成有毒烟雾。 Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.
燃烧产生的危险物品 <i>Hazardous Combustion Products</i>	二氧化碳。 Carbon dioxide.
灭火方法及灭火剂 <i>Fire-extinguishing Methods and Extinguishing Media</i>	对于小型火险，可使用水枪，干冰（也就是液态二氧化碳）或化学泡沫。 For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
灭火注意事项 <i>Attention in Fire-extinguishing</i>	因为压强关系，要穿戴可呼吸式全身防护装备，MSHA/NIOSH（经认证或等效的），以及佩戴全套防护装置。 Wear self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

第六部分 泄露应急处理
Section 6 - Accidental Release Measures

个人预防措施、防护装备和应急程序 <i>Personal Precautions, protective equipment, and emergency procedures</i>	万一破裂。注意！腐蚀性物质。避免接触皮肤，眼睛或衣服。确保空气流通。根据需要使用个人防护装备。将人员撤离到安全区域。让人们远离溢出/泄漏处和处于逆风。参考第七部分和第八部分中列出的防护措施。 In case of rupture. Attention! Corrosive material. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Refer to protective measures listed in Sections 7 and 8.
环境保护措施 <i>Environmental Precautions</i>	防止产品污染土壤和进入下水道或水道。 Prevent product from contaminating soil and from entering sewers or waterways.
方法和材料控制 <i>Methods and materials for Containment</i>	出于安全，阻止泄漏，可以用干砂或泥土来遏制液体溢出，立即清理溢出物。 Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
清理的方法和材料 <i>Methods and materials for cleaning up</i>	用惰性吸收剂(干砂或泥土)吸收溢出的材料。污染物转移到可接受的废物容器中。收集所有受污染的吸收剂，按照第十三部分的说明进行处理。用洗涤剂和水清洁污染区域，收集所有受污染的洗涤剂，妥善处理。 Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.



第七部分 操作处置与储存
Section 7 - Handling and Storage

操作 <i>Handling</i>	拆解、挤压、直接放入火中或高温条件下，电池可能发生爆炸和燃烧。禁止短路或将电池正负极错误的安装在设备中。 In case of rupture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.
储存 <i>Storage</i>	储藏于阴凉，干燥，通风处，远离接触会发生反应的材料。存储锁定。放在儿童无法接触的地方。 Store in a cool, dry, well-ventilated area away from incompatible substances. Store locked up. Keep out of the reach of children.
其他要注意的防范措施 <i>Other Precautions</i>	万一破裂。按照良好的工业卫生和安全规范进行操作。避免接触皮肤，眼睛或衣服。使用个人防护设备。 The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

第八部分 接触控制和个体防护
Section 8 - Exposure Controls/Personal Protection

工程控制 <i>Engineering Controls</i>	保证空气流通使空气密度保持在低水平。如果在会生成微粒的情况下使用，应仔细观察 3mg/m ³ ACGIH TLV-TWA 的吸入量（总量为 10mg/m ³ ）。 Use adequate ventilation to keep airborne concentrations low. If used under conditions that generate particulates, the ACGIH TLV-TWA of 3mg/m ³ respirable fraction (10mg/m ³ total) should be observed.
个人防护设备 <i>Personal Protective Equipment</i>	眼睛和脸部保护：消费者无需使用。如果有接触危险：密封安全护目镜。面部防护罩。 Eye and Face Protection: None required for consumer use. If there is a risk of contact: Tight sealing safety goggles. Face protection shield. 皮肤和身体防护：消费者无需使用。如果有接触危险：穿戴防护手套和防护服。 Skin and Body Protection: None required for consumer use. If there is a risk of contact: Wear protective gloves and protective clothing. 呼吸系统防护：正常使用条件下不需要防护设备。如果超过暴露限值或发生刺激，可能需要通风和疏散。 Respiratory Protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

第九部分 理化特性
Section 9 - Physical and Chemical Properties

物理状态 <i>Physical State</i>	外形：棱形 Appearance: Prismatic
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	颜色: 黑色 Color: Black
	气味: 泄漏时, 医用乙醚的气味。 Odour: If leaking, smells of medical ether.
变化的条件: Change in condition	
酸碱度 pH	不适用。 Not applicable as supplied.
熔点/凝固点 Melting point/freezing point	不适用。 Not applicable as supplied.
沸点、初沸点和沸程 Initial boiling point and boiling range	不适用。 Not applicable as supplied.
闪点 Flash Point	不适用。 Not applicable as supplied.
爆炸极限 Explosion Limits	不适用。 Not applicable as supplied.
蒸气压 Vapour pressure	不适用。 Not applicable as supplied.
蒸气密度 Vapor density	不适用。 Not applicable as supplied.
密度/相对密度 density/Relative density:	不适用。 Not applicable as supplied.
溶解性 Solubility	不适用。 Not applicable as supplied.
n-辛醇/水分配系数 Partition coefficient: n-octanol/water	不适用。 Not applicable as supplied.
自燃温度 Auto-ignition temperature	不适用。 Not applicable as supplied.
分解温度 Decomposition temperature	不适用。 Not applicable as supplied.
气味阈值 Odour threshold	不适用。 Not applicable as supplied.
蒸发速率 Evaporation rate	不适用。 Not applicable as supplied.
易燃性(固体、气体) Flammability (solid, gas)	不适用。 Not applicable as supplied.

第十部分 稳定性和反应性
Section 10 - Stability and Reactivity

化学稳定性 Chemical Stability	稳定的。 Stable.
危险反应的可能性 Possibility of Hazardous Reactions	不适用。 Not Available.
应避免的条件 Conditions to Avoid	火焰、火花和其他火源, 不相容的材料。 Flames, sparks, and other sources of ignition, incompatible materials.

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不相容材料 Incompatible materials	氧化剂、酸、碱。 Oxidizing agents, acid, base.
有危害分解物 Hazardous Decomposition Products	一氧化碳、二氧化碳、氧化锂烟雾。 Carbon monoxide, carbon dioxide, lithium oxide fumes.

第十一部分 毒理学信息
Section 11 - Toxicological Information

刺激 Irritation	内部物质暴露的情况下, 蒸汽烟雾可能对眼睛和皮肤的刺激性。 In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.
致敏 Sensitization	不适用。 Not Available.
再生毒性 Reproductive Toxicity	不适用。 Not Available.
协同材料毒理学 Toxicologically Synergistic Materials	不适用。 Not Available.

第十二部分 生态学信息
Section 12 - Ecological Information

通用信息: General note:	不允许未稀释或大量的产品接触地下水、水道或污水处理系统。 Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
化学产品在环境/可能的环境预期的行为的一种生态毒性 Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity	不适用。 Not Available.

第十三部分 废弃处置
Section 13 - Disposal Considerations

废弃处置方法 Waste Treatment	建议遵照国家和地方法规处置或再利用。 Recycle or dispose of in accordance with government, state & local regulations.
废弃注意事项 Attention for Waste Treatment	废电池不能被当作普通垃圾。不能扔进火中或置于高温下。不能解体, 刺穿, 破碎或类似的处理。最好的处理办法是回收利用。 Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling.

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第十四部分 运输信息
Section 14 - Transport Information

UN 编号 UN number	UN3480 or UN3481
运输专用名称 Proper shipping name	锂离子电池（包括锂离子聚合物电池）或 Lithium ion batteries (including lithium ion polymer batteries) or 与设备包装在一起的锂离子电池（包括锂离子聚合物电池）或 Lithium ion batteries packed with equipment (including lithium ion polymer batteries) or 内置在设备中的锂离子电池（包括锂离子聚合物电池） Lithium ion batteries contained in equipment (including lithium ion polymer batteries)
危险货物类别 Class or division	9
海洋污染物（是/否） Marine pollutant (Yes/No)	否 No
包装等级 Packing group	I
备注 Comment	包装必须达到 II 级包装的性能标准 Packagings must meet packing group II performance standard
无论是对内还是对外的运输或运输方式，用户都需要注意或遵守的特殊预防措施。 Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises	
国际民间航空组织/国际航空运输协会: ICAO / IATA:	货物可根据民用航空组织(ICAO), TI或国际航空运输协会(IATA), DGR 65 th (2024版)包装说明(PI)965 Section IA或PI 966 Section I 或PI 967 Section I 相关规定进行空运。 Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 965 Section IA, or (PI) 966 Section I, or (PI) 967 Section I appropriate of IATA DGR 65 th (2024 Edition) for transportation.
国际海运危险货物规则: IMDG CODE:	该电池受IMDG Code 2022 版(Amdt 41-22)限制,包装说明P903. Can be shipped by sea in accordance with IMDG Code 2022 Edition (Amdt 41-22) Packing Instructions P903.
此外，每个锂电池和电池组类型都必须通过联合国《关于危险货物运输的建议书 试验和标准手册》第 38.3 节规定的适用测试 In addition, to be permitted in transport each lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Tests and Criteria.	

第十五部分 法规信息
Section 15 - Regulatory Information

- a) 《危险物品规则》
Dangerous Goods Regulations
b) 联合国《关于危险货物运输的建议书 规章范本》



- Recommendations on the Transport of Dangerous Goods-Model Regulations
c) 联合国《关于危险货物运输的建议书 试验和标准手册》
Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria
d) 《国际航空运输协会》(IATA)
International Air Transport Association (IATA)
e) 《国际海运危险货物规则》(IMDG)
International Maritime Dangerous Goods (IMDG)
f) 《危险货物安全运输技术指南》
Technical Instructions for the Safe Transport of Dangerous Goods
g) 《危险货物分类和品名编号》- GB 6944-2012
Classification and code of dangerous goods (GB 6944-2012)
h) 2012《职业安全与健康标准》危险通信标准 (29 CFR 1910.1200)
2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
i) 《有毒物质控制法》(TSCA)
Toxic Substance Control Act (TSCA)
j) 《联邦条例》
Code of Federal Regulations
k) 符合所有联邦、州和地方法律
In accordance with all Federal, State and local laws

第十六部分 其他信息
Section 16 - Other Information

本份 MSDS 中的信息只是基于我们当前所拥有的相关材料的信息而编制的，只是为了描述本品的健康、安全与环境需求，以使各有关方面能更好地了解和信任本产品。这些信息只是提供给您，以供考虑、研究和确认。其中的一些危害预防措施描述并非唯一的。所以本份 MSDS 不能作为使用本品实现任何特定目的的保证。各有关使用者有责任预先完成本品的安全性及其他方面的测试，以评判其是否满足您的使用目的。

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

本文所包含的数据/信息已经过审核和批准，但本文档不包含出口管制信息。
The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

样品图片：
Sample photo:

11.2 20AH Battery MSDS



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--报告结束--
--End of report--



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Material Safety Data Sheet

MSDS 报告

MSDS Report

申请商: Prepared For:	上海邦邦机器人有限公司 Shanghai Bangbang Robotics Co.,Ltd..		
地址: Address:	上海市松江区中辰路 188 号 3 幢 501 室 Room 501, Building 3, No.188 Zhongchen Road, Songjiang District, Shanghai		
产品名称: Product Name:	锂离子电池组 Li-ion Battery Pack		
型号: Model:	LY-BT-09		
标称电压: Nominal Voltage:	24V		
额定容量: Rated Capacity:	20Ah, 480Wh		
质量: Weight:	Approx(约). 3346.8g		
尺寸: Dimension:	75.0mm×116.0mm×170.0mm (T×W×L)		
编制单位: Prepared By:	深圳诚测检测技术有限公司 Shenzhen CCJC Technology Co.,Ltd. 广东省深圳市宝安区沙井街道后亭社区沙松路135-3号101(1-3层) 1-3/F.,Building 101, No.135-3, Shasong Road, Houting, Shajing Street, Bao'an District, Shenzhen, Guangdong, China		
报告编号: Report No.:	CCJC2022A631505	检验日期: Inspection Date:	2024-01-23
签发日期: Issue date:	2024-01-23	生效日期: Effective Date	2024-01-23
编制 Compiler:	李楠楠	审核 Checker:	钟廷奎
		批准 Approver:	

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Material Safety Data Sheet

第一部分 化学品及企业标识
Section 1 - Chemical Product and Company Identification

产品名称: Product Name:	锂离子电池组 Li-ion Battery Pack
产品型号: Product Model:	LY-BT-09
制造商: Manufacture:	安徽超锂电子科技有限公司 Anhui Chaoli Electronic Technology Co., Ltd
地址: Address:	安徽省蚌埠市五河县城南中小产业园 19 号 No. 19, Chengnan middle and small industrial park, Wuhe County, Bengbu, Anhui
电话: Tel:	+86-512-63032237
传真: Fax:	/
应急电话: Emergency Tel:	+86-512-63032237
邮箱: E-mail:	fredque@163.com

第二部分 危险性概述
Section 2 - Hazards Identification

危险性类别 Classification of Danger	见第十四部分。 See section 14.
侵入途径 Primary Route(s) of Exposure	眼睛，皮肤接触，摄入。 Eye, skin contact, ingestion.
健康危害 Health Hazard	正常条件下根据制造商的说明使用电池不会产生危害。使用不当的情况下，有破裂、起火、发烫、内部成分泄漏的危险，并可能造成意外损失。使用不当的行为包括但不限于下列情况：长时间充电、短路、投入火中、硬物撞击、尖物刺破、破碎，和破裂。 The batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's risk of rupture, fire, heat, leakage of internal components, with could cause casualty loss. Abuses include but not limited to the following cases: charged for long time, short circuited, put into fire, whacked with hard object, punctured with acute object, crushed, and broken.

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第三部分 成分/组成信息
Section 3 – Composition/Information on Ingredients

化学名称 Chemical Composition	CAS 编号 CAS No.	浓度或浓度范围(%) Concentration or concentration ranges (%)
钴酸锂 Lithium Cobalt Oxide	12190-79-3	37.82
聚偏氟乙烯 Polyvinylidene Fluoride(PVDF)	24937-79-9	1.46
铝 Aluminum(Al)	7429-90-5	9.03
石墨 Graphite	7782-42-5	16.48
丁苯橡胶 Styrene-Butadiene Rubber (SBR)	61789-96-6	0.39
羧甲基纤维素 Carboxymethylcellulose	9000-11-7	0.31
铜 Copper (Cu)	7440-50-8	9.74
镍 Nickel (Ni)	7440-02-0	1.08
六氟磷酸锂 Lithium Hexafluorophosphate	21324-40-3	18.56
聚乙烯 Polyethylene	9002-88-4	3.03
尼龙 Nylon	24937-16-4	0.8
聚丙烯 Polypropylene	9003-07-0	1.3

标签根据EC指令。
Labeling according to EC directives.

不需要象形符号和危险短语。
No symbol and risk phrase are required.

注意: CAS 号是化学文摘服务注册号码。
Note: CAS number is Chemical Abstract Service Registry Number.

N/A =不适用。
N/A=Not apply.

第四部分 急救措施
Section 4 - First Aid Measures

眼睛 Eye	万一接触，立即用大量的清水冲洗至少15 分钟，翻起上下眼睑，直到化学的残留物消失为止，迅速就医。 Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
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皮肤 Skin	万一接触，用大量水冲洗至少15分钟，同时除去污染的衣物和鞋子，迅速就医。 Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.
吸入 Inhalation	立即从暴露处移至空气清新处，如果呼吸困难给予输氧，立即就医。 Remove from exposure and move to fresh air immediately. Use oxygen if available.
食入 Ingestion	饮用至少两杯牛奶或水。如果当事人仍然清醒可以采取催吐的方法，并且立即就医。 Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

第五部分 消防措施
Section 5 - Fire Fighting Measures

危险特性 Characteristics of Hazard	高密度粉尘遇空气会形成爆炸性混合物。燃烧生成有毒烟雾。 Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.
燃烧产生的危险物品 Hazardous Combustion Products	二氧化碳。 Carbon dioxide.
灭火方法及灭火剂 Fire-extinguishing Methods and Extinguishing Media	对于小型火险，可使用水枪，干冰（也就是液态二氧化碳）或化学沫。 For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
灭火注意事项 Attention in Fire-extinguishing	因为压强关系，要穿戴可呼吸式全身防护装备，MSHA/NIOSH（经认证或等效的），以及佩戴全套防护装置。 Wear self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

第六部分 泄露应急处理
Section 6 - Accidental Release Measures

个人预防措施、防护装备和应急程序 Personal Precautions, protective equipment, and emergency procedures	万一破裂。注意！腐蚀性物质。避免接触皮肤，眼睛或衣服。确保空气流通。根据需要使用个人防护装备。将人员撤离到安全区域。让人们远离溢出/泄漏处和处于逆风。参考第七部分和第八部分中列出的防护措施。 In case of rupture. Attention! Corrosive material. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Refer to protective measures listed in Sections 7 and 8.
环境保护措施 Environmental Precautions	防止产品污染土壤和进入下水道或水道。 Prevent product from contaminating soil and from entering sewers or waterways.
方法和材料控制 Methods and materials for Containment	出于安全，阻止泄漏，可以用干砂或泥土来遏制液体溢出，立即清理溢出物。 Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.

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清理的方法和材料 Methods and materials for cleaning up	用惰性吸收剂(干砂或泥土)吸收溢出的材料。污染物转移到可接受的废物容器中。收集所有受污染的吸收剂，按照第十三部分的说明进行处理。用洗涤剂和水清洁污染区域，收集所有受污染的洗涤水，妥善处理。 Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.
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第七部分 操作处置与储存
Section 7 - Handling and Storage

操作 Handling	拆解、挤压、直接放入火中或高温条件下，电池可能发生爆炸和燃烧。禁止短路或将电池正负极错误的安装在设备中。 In case of rupture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.
储存 Storage	储藏于阴凉，干燥，通风处，远离接触会发生反应的材料。存储锁定。放在儿童无法接触的地方。 Store in a cool, dry, well-ventilated area away from incompatible substances. Store locked up. Keep out of the reach of children.
其他要注意的防范措施 Other Precautions	万一破裂。按照良好的工业卫生和安全规范进行操作。避免接触皮肤，眼睛或衣服。使用个人防护设备。 The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

第八部分 接触控制和个体防护
Section 8 - Exposure Controls/Personal Protection

工程控制 Engineering Controls	保证空气流通使空气密度保持在低水平。如果在会生成微粒的情况下使用，应仔细观察 3mg/m³ ACGIH TLV-TWA 的吸入量（总量为 10mg/m³）。 Use adequate ventilation to keep airborne concentrations low. If used under conditions that generate particulates, the ACGIH TLV-TWA of 3mg/m³ respirable fraction (10mg/m³ total) should be observed.
个人防护设备 Personal Protective Equipment	眼睛和脸部保护：消费者无需使用。如果有接触危险：密封安全护目镜。面部防护罩。 Eye and Face Protection: None required for consumer use. If there is a risk of contact: Tight sealing safety goggles. Face protection shield. 皮肤和身体防护：消费者无需使用。如果有接触危险：穿戴防护手套和防护服。 Skin and Body Protection: None required for consumer use. If there is a risk of contact: Wear protective gloves and protective clothing. 呼吸系统防护：正常使用条件下不需要防护设备。如果超过暴露限值或发生刺激，可能需要通风和疏散。 Respiratory Protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

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第九部分 理化特性
Section 9 - Physical and Chemical Properties

物理状态 Physical State	外形：棱形 Appearance: Prismatic
	颜色：黑色 Color: Black
	气味：泄漏时，医用乙醚的气味。 Odour: If leaking, smells of medical ether.
变化的条件: Change in condition	
酸碱度 pH	不适用。 Not applicable as supplied.
闪点 Flash Point	除非单个的组件暴露，否则不适用。 Not applicable unless individual components exposed.
易燃度 Flammability	除非单个的组件暴露，否则不适用。 Not applicable unless individual components exposed.
相对密度 Relative density:	除非单个的组件暴露，否则不适用。 Not applicable unless individual components exposed.
溶解性（水溶性） Solubility (water)	除非单个的组件暴露，否则不适用。 Not applicable unless individual components exposed.
溶解性（其他） Solubility (other)	除非单个的组件暴露，否则不适用。 Not applicable unless individual components exposed.

第十部分 稳定性和反应性
Section 10 - Stability and Reactivity

化学稳定性 Chemical Stability	稳定的。 Stable.
危险反应的可能性 Possibility of Hazardous Reactions	不适用。 Not Available.
应避免的条件 Conditions to Avoid	火焰、火花和其他火源，不相容的材料。 Flames, sparks, and other sources of ignition, incompatible materials.
不相容材料 Incompatible materials	氧化剂、酸、碱。 Oxidizing agents, acid, base.
有危害分解物 Hazardous Decomposition Products	一氧化碳、二氧化碳、氧化锂烟雾。 Carbon monoxide, carbon dioxide, lithium oxide fumes.

第十一部分 毒理学信息
Section 11 - Toxicological Information

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刺激 Irritation	内部物质暴露的情况下，蒸汽烟雾可能对眼睛和皮肤的刺激性。 In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.
致敏 Sensitization	不适用。 Not Available.
再生毒性 Reproductive Toxicity	不适用。 Not Available.
协同材料毒理学 Toxicologically Synergistic Materials	不适用。 Not Available.

第十二部分 生态学信息
Section 12 - Ecological Information

通用信息: General note:	不允许未稀释或大量的产品接触地下水、水道或污水处理系统。 Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
化学产品在环境可能的环境预期的行为的一种生态毒性 Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity	不适用。 Not Available.

第十三部分 废弃处置
Section 13 - Disposal Considerations

废弃处置方法 Waste Treatment	建议遵照国家和地方法规处置或再利用。 Recycle or dispose of in accordance with government, state & local regulations.
废弃注意事项 Attention for Waste Treatment	废电池不能被当作普通垃圾。不能扔进火中或置于高温下。不能解体，刺穿，破碎或类似的处理。最好的处理办法是回收利用。 Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling.

第十四部分 运输信息
Section 14 - Transport Information

UN 编号 UN number	UN3480 or UN3481
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运输专用名称 Proper shipping name	锂离子电池（包括锂离子聚合物电池）或 Lithium ion batteries (including lithium ion polymer batteries) or 与设备包装在一起的锂离子电池（包括锂离子聚合物电池）或 Lithium ion batteries packed with equipment (including lithium ion polymer batteries) or 内置在设备中的锂离子电池（包括锂离子聚合物电池） Lithium ion batteries contained in equipment (including lithium ion polymer batteries)
危险货物类别 Class or division	9
海洋污染物（是/否） Marine pollutant (Yes/No)	否 No
包装等级 Packing group	/
备注 Comment	包装必须达到 II 级包装的性能标准 Packagings must meet packing group II performance standard
无论是对内还是对外的运输或运输方式，用户都需要注意或遵守的特殊预防措施。 Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises	
国际民间航空组织/国际航空运输协会: ICAO / IATA:	货物可根据民用航空组织(ICAO), TI或国际航空运输协会(IATA), DGR 65 th (2024版)包装说明(PI)965 Section IA或PI 966 Section I 或PI 967 Section I 相关规定进行空运。 Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 965 Section IA, or (PI) 966 Section I, or (PI) 967 Section I appropriate of IATA DGR 65 th (2024Edition) for transportation.
国际海运危险货物规则: IMDG CODE:	该电池受IMDG Code 2022 版(Amdt 41-22)限制,包装说明P903. Can be shipped by sea in accordance with IMDG Code 2022 Edition (Amdt 41-22) Packing Instructions P903.
此外，每个锂电池和电池组类型都必须通过联合国《关于危险货物运输的建议书 试验和标准手册》第38.3 节规定的适用测试 In addition, to be permitted in transport each lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Tests and Criteria.	

第十五部分 法规信息
Section 15 - Regulatory Information

- a) 《危险物品规则》
Dangerous Goods Regulations
- b) 联合国《关于危险货物运输的建议书 规章范本》
Recommendations on the Transport of Dangerous Goods-Model Regulations
- c) 联合国《关于危险货物运输的建议书 试验和标准手册》
Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria
- d) 《国际航空运输协会》（IATA）
International Air Transport Association (IATA)
- e) 《国际海运危险货物规则》（IMDG）

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

Tel: (86-755)23707853 Http: //www.ccjctek.com Email: lab@ccjctek.com
Add:1-3/F, Building 101, No.135-3, Shasong Road, Houting, Shajing Street, Bao'an District, Shenzhen, Guangdong, China



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- International Maritime Dangerous Goods (IMDG)
- f) 《危险货物安全运输技术指南》
Technical Instructions for the Safe Transport of Dangerous Goods
- g) 《危险货物分类和品名编号》- GB 6944-2012
Classification and code of dangerous goods (GB 6944-2012)
- h) 2012《职业安全与健康标准》危险通信标准（29 CFR 1910.1200）
2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
- i) 《有毒物质控制法》（TSCA）
Toxic Substance Control Act (TSCA)
- j) 《联邦条例》
Code of Federal Regulations
- k) 符合所有联邦、州和地方法律
In accordance with all Federal, State and local laws

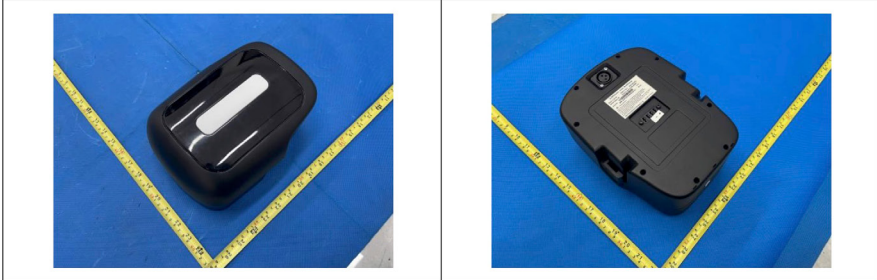
第十六部分 其他信息
Section 16 - Other Information

本份 MSDS 中的信息只是基于我们当前所拥有的相关材料的信息而编制的，只是为了描述本品的健康、安全与环境需求，以使各有关方面能更好地了解和信任本产品。这些信息只是提供给您，以供考虑、研究和确认。其中的一些危害预防措施描述并非唯一的。所以本份 MSDS 不能作为使用本品实现任何特定目的的保证。各有关使用者有责任预先完成本品的安全性及其他方面的测试，以评判其是否满足您的使用目的。

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

本文所包含的数据/信息已经过审核和批准，但本文档不包含出口管制信息。
The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

样品图片:
Sample photo:



--报告结束--

--End of report--

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

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11.3 25AH Battery MSDS



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Material Safety Data Sheet

MSDS 报告

MSDS Report

申请商: Prepared For:	上海邦邦机器人有限公司 Shanghai Bangbang Robotics Co.,Ltd.		
地址: Address:	上海市松江区中辰路 188 号 3 幢 501 室 Room 501, Building 3, No.188 Zhongchen Road, Songjiang District, Shanghai		
产品名称: Product Name:	锂离子电池 Lithium-ion battery		
型号: Model:	LY-BT-10		
参数: Parameters:	2.4V, 25Ah, 600Wh		
质量: Weight:	Approx(约). 3301.67g		
尺寸: Dimension:	227mm×180mm×110mm (T×W×L)		
编制单位: Prepared By:	深圳诚测检测技术有限公司 Shenzhen CCJC Technology Co.,Ltd. 广东省深圳市宝安区松岗街道溪头社区溪头路25号厂房101（1-3层） 1-3/F., Factory 101, No.25, Xitou Road, Xitou, Songgang Street, Bao'an District, Shenzhen, Guangdong, China		
报告编号: Report No.:	CCJC2023A868206	接收日期: Accepted date:	2025-03-04
检验日期: Inspection Date:	2025-03-05	生效日期: Effective Date:	2025-03-05
主检人: Tested by:	李远勇 Li Yuan Yong	批准人: Approved by:	程鹏 Roc Cheng
职位 Position:	测试工程师 Test Engineer	职位 Position:	技术负责人 Technical Manager
审核人: Inspected by:	钟庭芝 Tosha Zhong	签发日期: Date of Issue:	2025-03-06
职位 Position:	项目工程师 Project Engineer		



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Material Safety Data Sheet

第一部分 化学品及企业标识
Section 1 - Chemical Product and Company Identification

产品名称: Product Name:	锂离子电池 Lithium-ion battery
产品型号: Product Model:	LY-BT-10
制造商: Manufacture:	安徽超锂电子科技有限公司 Anhui Chaoli Electronic Technology Co., Ltd.
地址: Address:	安徽省蚌埠市五河县城南中小产业园 19 号 No. 19, Chengnan middle and small industrial park, Wuhe County, Bengbu, Anhui
电话: Tel:	+86-18120090111
传真: Fax:	/
应急电话: Emergency Tel:	+86-18120090111
邮箱: E-mail:	fredque@163.com

第二部分 危险性概述
Section 2 - Hazards Identification

危险性类别 Classification of Danger	见第十四部分。 See section 14.
侵入途径 Primary Route(s) of Exposure	眼睛，皮肤接触，摄入。 Eye, skin contact, ingestion.
健康危害 Health Hazard	正常条件下根据制造商的说明使用电池不会产生危害。使用不当的情况下，有破裂、起火、发烫、内部成分泄漏的危险，并可能造成意外损失。使用不当的行为包括但不限于下列情况：长时间充电、短路、投入火中、硬物撞击、尖物刺破、破碎，和破裂。 The batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's risk of rupture, fire, heat, leakage of internal components, with could cause casualty loss. Abuses include but not limited to the following cases: charged for long time, short circuited, put into fire, whacked with hard object, punctured with acute object, crushed, and broken.

第三部分 成分/组成信息
Section 3 – Composition/Information on Ingredients



化学名称 Chemical Composition	CAS 编号 CAS No.	浓度或浓度范围(%) Concentration or concentration ranges (%)
钴酸锂 Lithium Cobalt Oxide	12190-79-3	37.82
聚偏氟乙烯 Polyvinylidene Fluoride(PVDF)	24937-79-9	1.46
铝 Aluminum(Al)	7429-90-5	9.03
石墨 Graphite	7782-42-5	16.48
丁苯橡胶 Styrene-Butadiene Rubber (SBR)	61789-96-6	0.39
羧甲基纤维素 Carboxymethylcellulose	9000-11-7	0.31
铜 Copper (Cu)	7440-50-8	9.74
镍 Nickel (Ni)	7440-02-0	1.08
六氟磷酸锂 Lithium Hexafluorophosphate	21324-40-3	18.56
聚乙烯 Polyethylene	9002-88-4	3.03
尼龙 Nylon	24937-16-4	0.8
聚丙烯 Polypropylene	9003-07-0	1.3

标签根据EC指令。
Labeling according to EC directives.

不需要象形符号和危险短语。
No symbol and risk phrase are required.

注意: CAS 号是化学文摘服务注册号码。
Note: CAS number is Chemical Abstract Service Registry Number.

N/A =不适用。
N/A=Not apply.

第四部分 急救措施
Section 4 - First Aid Measures

眼睛 Eye	万一接触，立即用大量的清水冲洗至少15 分钟，翻起上下眼睑，直到化学的残留物消失为止，迅速就医。 Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
皮肤 Skin	万一接触，用大量水冲洗至少15 分钟，同时除去污染的衣物和鞋子，迅速就医。 Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.



吸入 Inhalation	立即从暴露处移至空气清新处，如果呼吸困难给予输氧，立即就医。 Remove from exposure and move to fresh air immediately. Use oxygen if available.
食入 Ingestion	饮用至少两杯牛奶或水。如果当事人仍然清醒可以采取催吐的方法，并且立即就医。 Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

第五部分 消防措施
Section 5 - Fire Fighting Measures

危险特性 Characteristics of Hazard	高密度粉尘遇空气会形成爆炸性混合物。燃烧生成有毒烟雾。 Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.
燃烧产生的危险物品 Hazardous Combustion Products	二氧化碳。 Carbon dioxide.
灭火方法及灭火剂 Fire-extinguishing Methods and Extinguishing Media	对于小型火险，可使用水枪，干冰（也就是液态二氧化碳）或化学泡沫。 For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
灭火注意事项 Attention in Fire-extinguishing	因为压强关系，要穿戴可呼吸式全身防护装备，MSHA/NIOSH（经认证或等效的），以及佩戴全套防护装置。 Wear self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

第六部分 泄露应急处理
Section 6 - Accidental Release Measures

个人预防措施、防护装备和应急程序 Personal Precautions, protective equipment, and emergency procedures	万一破裂。注意！腐蚀性物质。避免接触皮肤，眼睛或衣服。确保空气流通。根据需要使用个人防护装备。将人员撤离到安全区域。让人们远离溢出/泄漏处和处于逆风。参考第七部分和第八部分中列出的防护措施。 In case of rupture. Attention! Corrosive material. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Refer to protective measures listed in Sections 7 and 8.
环境保护措施 Environmental Precautions	防止产品污染土壤和进入下水道或水道。 Prevent product from contaminating soil and from entering sewers or waterways.
方法和材料控制 Methods and materials for Containment	出于安全，阻止泄漏，可以用干砂或泥土来遏制液体溢出，立即清理溢出物。 Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
清理的方法和材料 Methods and materials for cleaning up	用惰性吸收剂(干砂或泥土)吸收溢出的材料。污染物转移到可接受的废物容器中。收集所有受污染的吸收剂，按照第十三部分的说明进行处理。用洗涤剂和水清洁污染区域，收集所有受污染的洗涤水，妥善处理。 Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

第七部分 操作处置与储存
Section 7 - Handling and Storage



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操作 Handling	拆解、挤压、直接放入火中或高温条件下，电池可能发生爆炸和燃烧。禁止短路或将电池正负极错误的安装在设备中。 In case of rupture. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.
储存 Storage	储藏于阴凉，干燥，通风处，远离接触会发生反应的材料。存储锁定。放在儿童无法接触的地方。 Store in a cool, dry, well-ventilated area away from incompatible substances. Store locked up. Keep out of the reach of children.
其他要注意的防范措施 Other Precautions	万一破裂。按照良好的工业卫生和安全规范进行操作。避免接触皮肤，眼睛或衣服。使用个人防护设备。 The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

第八部分 接触控制和个体防护
Section 8 - Exposure Controls/Personal Protection

工程控制 Engineering Controls	保证空气流通使空气密度保持在低水平。如果在会生成微粒的情况下使用，应仔细观察3mg/m³ ACGIH TLV-TWA 的吸入量（总量为 10mg/m³）。 Use adequate ventilation to keep airborne concentrations low. If used under conditions that generate particulates, the ACGIH TLV-TWA of 3mg/m³ respirable fraction (10mg/m³ total) should be observed.
个人防护设备 Personal Protective Equipment	眼睛和脸部保护：消费者无需使用。如果有接触危险：密封安全护目镜。面部防护罩。 Eye and Face Protection: None required for consumer use. If there is a risk of contact: Tight sealing safety goggles. Face protection shield. 皮肤和身体防护：消费者无需使用。如果有接触危险：穿戴防护手套和防护服。 Skin and Body Protection: None required for consumer use. If there is a risk of contact: Wear protective gloves and protective clothing. 呼吸系统防护：正常使用条件下不需要防护设备。如果超过暴露限值或发生刺激，可能需要通风和疏散。 Respiratory Protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

第九部分 理化特性
Section 9 - Physical and Chemical Properties

物理状态 Physical State	外形：棱柱形 Appearance: Prismatic 颜色：黑色 Color: Black 气味：泄漏时，医用乙醚的气味。 Odour: If leaking, smells of medical ether.
变化的条件: Change in condition	



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酸碱度 pH	不适用。 Not applicable as supplied.
熔点/凝固点 Melting point/freezing point	不适用。 Not applicable as supplied.
沸点、初沸点和沸程 Initial boiling point and boiling range	不适用。 Not applicable as supplied.
闪点 Flash Point	不适用。 Not applicable as supplied.
爆炸极限 Explosion Limits	不适用。 Not applicable as supplied.
蒸气压 Vapour pressure	不适用。 Not applicable as supplied.
蒸气密度 Vapor density	不适用。 Not applicable as supplied.
密度/相对密度 density/Relative density:	不适用。 Not applicable as supplied.
溶解性 Solubility	不适用。 Not applicable as supplied.
n-辛醇/水分配系数 Partition coefficient: n-octanol/water	不适用。 Not applicable as supplied.
自燃温度 Auto-ignition temperature	不适用。 Not applicable as supplied.
分解温度 Decomposition temperature	不适用。 Not applicable as supplied.
气味阈值 Odour threshold	不适用。 Not applicable as supplied.
蒸发速率 Evaporation rate	不适用。 Not applicable as supplied.
易燃性(固体、气体) Flammability (solid, gas)	不适用。 Not applicable as supplied.

第十部分 稳定性和反应性
Section 10 - Stability and Reactivity

化学稳定性 Chemical Stability	稳定的。 Stable.
危险反应的可能性 Possibility of Hazardous Reactions	不适用。 Not Available.
应避免的条件 Conditions to Avoid	火焰、火花和其他火源，不相容的材料。 Flames, sparks, and other sources of ignition, incompatible materials.
不相容材料 Incompatible materials	氧化剂、酸、碱。 Oxidizing agents, acid, base.
有危害分解物 Hazardous Decomposition Products	一氧化碳、二氧化碳、氧化锂烟雾。 Carbon monoxide, carbon dioxide, lithium oxide fumes.



第十一部分 毒理学信息
Section 11 - Toxicological Information

刺激 Irritation	内部物质暴露的情况下，蒸汽烟雾可能对眼睛和皮肤的刺激性。 In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.
致敏 Sensitization	不适用。 Not Available.
再生毒性 Reproductive Toxicity	不适用。 Not Available.
协同材料毒理学 Toxicologically Synergistic Materials	不适用。 Not Available.

第十二部分 生态学信息
Section 12 - Ecological Information

通用信息: General note:	不允许未稀释或大量的产品接触地下水、水道或污水处理系统。 Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
化学产品对环境/可能的环境预期的行为的一种生态毒性 Anticipated behavior of a chemical product in environment/possible environmental impact/ ecotoxicity	不适用。 Not Available.

第十三部分 废弃处置
Section 13 - Disposal Considerations

废弃处置方法 Waste Treatment	建议遵照国家和地方法规处置或再利用。 Recycle or dispose of in accordance with government, state & local regulations.
废弃注意事项 Attention for Waste Treatment	废电池不能被当作普通垃圾。不能扔进火中或置于高温下。不能解体，刺穿，破碎或类似的处理。最好的处理办法是回收利用。 Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling.

第十四部分 运输信息
Section 14 - Transport Information

UN 编号 UN number	UN3480 or UN3481
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运输专用名称 Proper shipping name	锂离子电池（包括锂离子聚合物电池）或 Lithium ion batteries (including lithium ion polymer batteries) or 与设备包装在一起的锂离子电池（包括锂离子聚合物电池）或 Lithium ion batteries packed with equipment (including lithium ion polymer batteries) or 内置在设备中的锂离子电池（包括锂离子聚合物电池） Lithium ion batteries contained in equipment (including lithium ion polymer batteries)
危险货物类别 Class or division	9
海洋污染物（是/否） Marine pollutant (Yes/No)	否 No
包装等级 Packing group	/
备注 Comment	包装必须达到 II 级包装的性能标准 Packagings must meet packing group II performance standard
无论是对内还是对外的运输或运输方式，用户都需要注意或遵守的特殊预防措施。 Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises	
国际民用航空组织/国际航空运输协会: ICAO / IATA:	货物可根据民用航空组织(ICAO), TI或国际航空运输协会(IATA), DGR 66 th (2025版)包装说明(PI)965 Section IA或PI 966 Section I 或PI 967 Section I 相关规定进行空运。 Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 965 Section IA, or (PI) 966 Section I, or (PI) 967 Section I appropriate of IATA DGR 66 th (2025 Edition) for transportation.
国际海运危险货物规则: IMDG CODE:	该电池受IMDG Code 2024 版(Amdt 42-24)限制,包装说明P903. Can be shipped by sea in accordance with IMDG Code 2024 Edition (Amdt 42-24) Packing Instructions P903.
此外，每个锂电池和电池组类型都必须通过联合国《关于危险货物运输的建议书 试验和标准手册》第38.3 节规定的适用测试 In addition, to be permitted in transport each lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Tests and Criteria.	

第十五部分 法规信息
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Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria
- d) 《国际航空运输协会》（IATA）
International Air Transport Association (IATA)
- e) 《国际海运危险货物规则》（IMDG）



- International Maritime Dangerous Goods (IMDG)
- f) 《危险货物安全运输技术指南》
Technical Instructions for the Safe Transport of Dangerous Goods
 - g) 《危险货物分类和品名编号》- GB 6944-2012
Classification and code of dangerous goods (GB 6944-2012)
 - h) 2012《职业安全与健康标准》危险通信标准（29 CFR 1910.1200）
2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
 - i) 《有毒物质控制法》（TSCA）
Toxic Substance Control Act (TSCA)
 - j) 《联邦条例》
Code of Federal Regulations
 - k) 符合所有联邦、州和地方法律
In accordance with all Federal, State and local laws

第十六部分 其他信息
Section 16 - Other Information

本份 MSDS 中的信息只是基于我们当前所拥有的相关材料的信息而编制的，只是为了描述本品的健康、安全与环境需求，以使各有关方面能更好地了解和信任本产品。这些信息只是提供给您，以供考虑、研究和确认。其中的一些危害预防措施描述并非唯一的。所以本份 MSDS 不能作为使用本品实现任何特定目的的保证。各有关使用者有责任预先完成本品的安全性及其他方面的测试，以评判其是否满足您的使用目的。

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Sample photo:



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--End of report--

