

Introduction

Dear clients,

Thank you for choosing BBR, a smart mobility aid (hereinafter referred to as the "BBR"), of Shanghai BangBang Robotics Co., Ltd. Product Manual is a critical document includes the product information, operation process and on after-sales service. Please do read the Product Manual carefully before use to ensure proper operation and maintenance. Given its importance, please properly keep the document.

The product strictly observes the following national codes on research and design:

GB 4943.1-2011 Information Technology Equipment Safety Part 1: General Requirements

GB 5226.1-2008 Electrical Safety of Machinery - Electrical Equipment of Machines - Part 1: General Requirements

The Manual introduces all the function of the robotics, which may be not available on this product, but only on some models. For information on the configuration of the product, please refer the sales materials (purchase contract or shipping list) and check the physical product. For more information, please contact BangBang distributors or the official customer service.

All the data in the Manual prevails as the document is finalized. And only apply to the correctly model, the Company will keep optimizing and improving the configuration and performance of the product, Hence there will be possible differences between the product and the illustrations in the Manual. None of the current data, illustrations or explanations should be used as the basis of raising any requirement.

- Unless otherwise specified, the described directions such as front, back, left, right, up and down refer to the directions for a user that stands at the foot rests and grabs the handrails with both hands while facing the control panel.
- The illustrations, which are meant to help with understanding and could be taken as illustrative diagrams, might difer from the physical product.

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1.Safety

Please carefully read the Safety section before use and properly use the product as guided by the Manual. The safety reminders help use the product safely and properly. In order to differentiate various degrees of harm and damage, the possible damage brought by misuse is categorized into "warning" and "caution". The two are both critical reminders on safety and require strict compliance.

1.1 Signs



Warning

- Use of this sign indicates hazardous situations that may cause serious injury when neglected.



Caution

- Use of this sign indicates hazardous situations that may cause mild or moderate injury and material damage when neglected.



Notice

- The sign  indicates the necessity to refer to content in the "Notice" box in the section.

1.2 Indication

The product is applicable to people unable to independently stand or walk due to lower limb disabled at the rehabilitation and sequela phase between 150-190cm in height and 40-100kg in weight, including but not limited to:

- Patients with motor or sensory neurological dysfunctions after central nervous system injury: cerebral stroke, traumatic brain injury, spinal cord injury, poliomyelitis and cerebral palsy etc.
- Patients with spinal muscular atrophy (SMA), muscular dystrophy (congenital, DMD, BMD, limb-girdle), and myasthenia gravis (MG).
- The elderly with low muscle strength and impaired mobility.
- People that need be relocated for a short distance, but are not able or suitable to move independently.



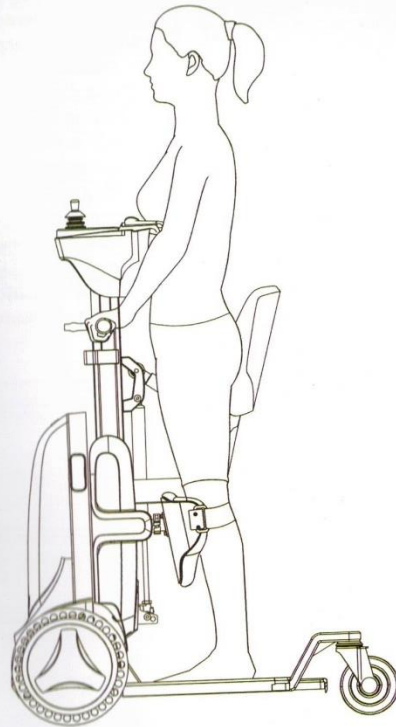
Caution

- Professional guidance is required for use for the first time. Users shall evaluate their own conditions or consult related professionals based on their conditions.
- Users aged under 14 and above 65 shall use the product only in the company of their guardians or family members.

2. Product Introduction

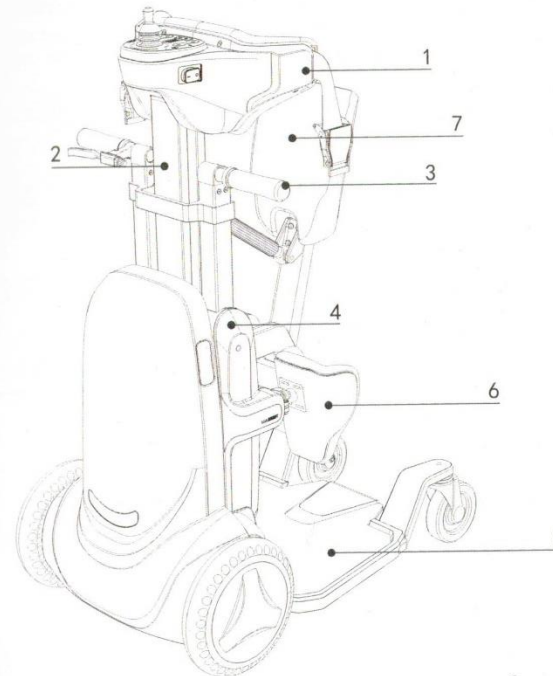
The product is a smart mobility aid independently developed by Shanghai BangBang Robotics Co., Ltd. It provides people suffering lower extremity motor dysfunction with daily life assistance such as standing and moving, partial self-care, squatting exercise, stretching exercise of Achilles tendon and balancing exercise, as well as rehabilitation support. The product mainly consists of main equipment and APP.

Main equipment is the carrier for realizing the product's functions and is adjustable at multiple structures to adapt to users of different heights and weights. APP can remotely control the BBR, reflect the usage status of the BBR real-time and adjust and set the parameters of all the electronic control modules.



2.1 Main Equipment

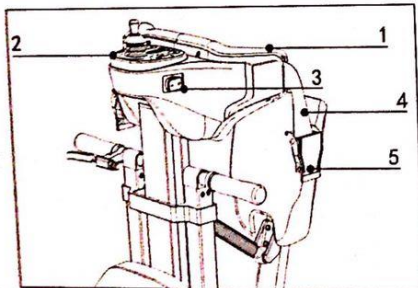
The main equipment is divided into the following modules: upper support, swing arm, handrails, upper frame, chassis, leggings and seat.



- | | | |
|-------------------------|---------------------|--------------------|
| 1- Upper support module | 2- Swing arm module | 3- Handrail module |
| 4- Upper frame module | 5- Chassis module | 6- Legging module |
| 7- Seat module | | |

2.1.1 Upper Support Module

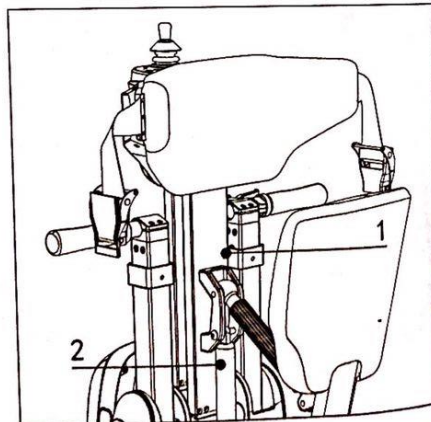
The upper support module is located at the top of the BBR and connects with the swing arm module. It is intended to support the waist and abdomen of users and prevent them from tilting forward above the waist. Its contact area with body of users has a pad to improve comfort. The module is embedded with an electric control panel for control of the product operation and realization of the functions.



- 1 – Upper support pad
- 2 – Control panel
- 3 – Main power switch
- 4 – Binding band with safety clip
- 5 – Wearable safety clip

2.1.2 Swing Arm Module

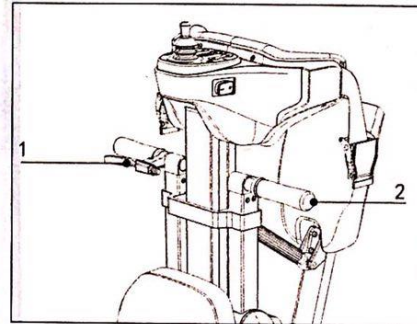
The swing arm module connects the upper support module and the upper frame module. The swing arm can be locked anywhere within its swing scope and the lock/unlock is controlled by the swing-arm control brake on the handrail module. By swinging up and down, the swing arm assists the users to stand up and sit down.



- 1 – Swing arm
- 2 – Swing arm booster

2.1.3 Handrail Module

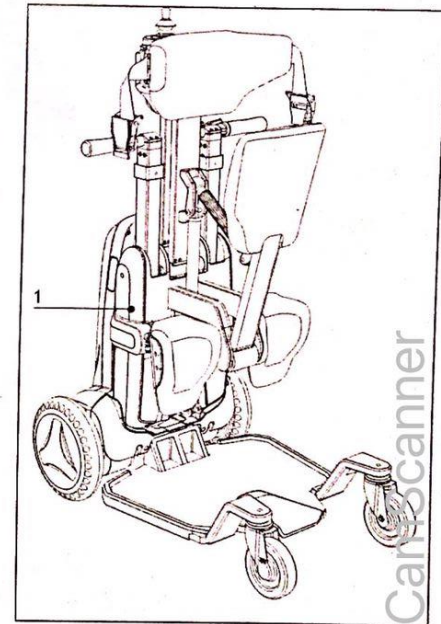
The handrail module connects with the upper frame module to assist the users with standing and squatting exercise.



- 1 – Swing arm control brake
- 2 – Handrail handle

2.1.4 Upper Frame Module

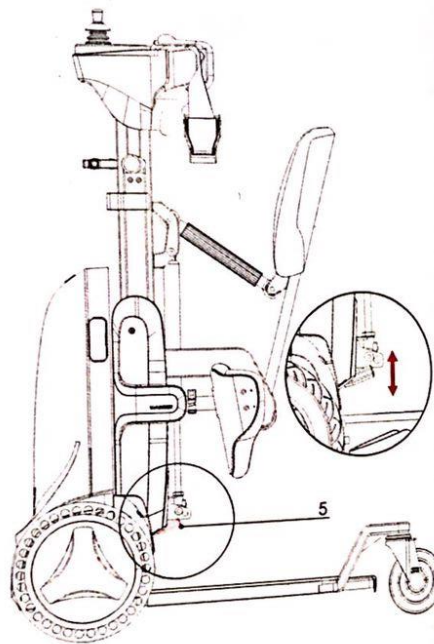
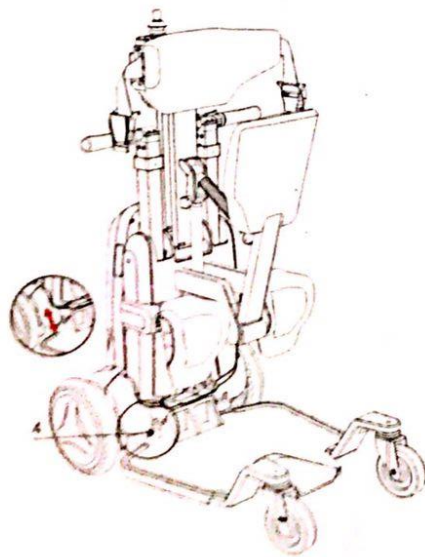
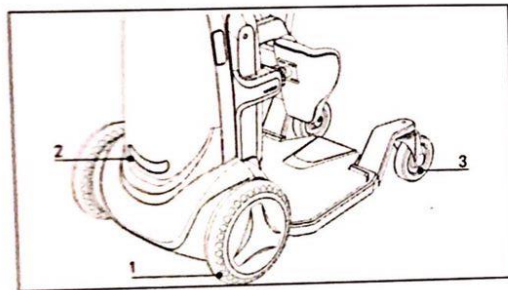
The upper frame module connects the handrails, swing arm, chassis and leggings. Its height can be adjusted to adapt to users within the specified height scope.



- 1 – Upper frame module

2.1.5 Chassis Module

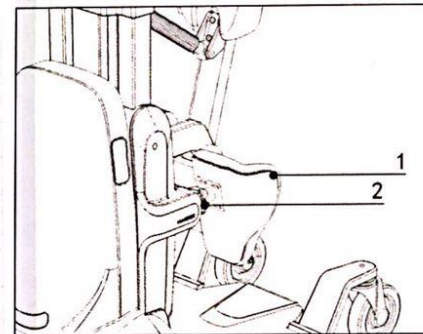
The chassis connects the upper frame module and the seat module and acts as the support for all the module parts. It consists of front wheel module of chassis, LED light, rear wheels, lock switch for hub motor and adjustment switch for the upper frame module.



- 1 – Front wheel module of chassis
- 2 – LED light
- 3 – Rear wheels
- 4 – Lock switch for hub motor (pull up to unlock)
- 5 – Adjustment switch for the upper frame module (pull up to unlock)

2.1.6 Legging Module

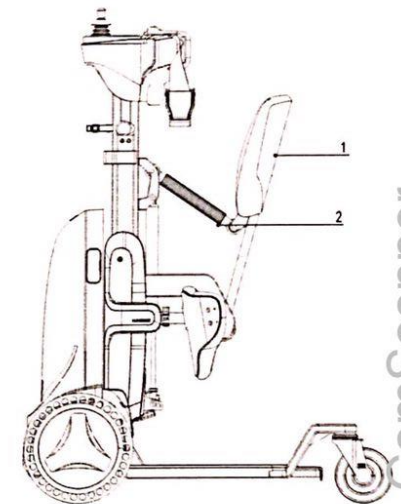
The legging module is used to support shanks of users as one of the main force bearing parts during standing. Its contact area with body of users has a pad to improve comfort. In order to adapt to users of different shapes, location of the pad relative to the chassis module is adjustable to the front and back, to the left and right and up and down.



- 1 – Legging module
- 2 – Legging adjustment module

2.1.7 Seat Module

The seat module offers support for buttocks of users when they are sitting and standing. The seat module is equipped with a cushion to bring comfortable experience for the users. In order to adapt to users of different shapes, the distance between the seat and the chest protector can be adjusted by adjusting the connecting rod of the seat.



- 1 - Seat module
- 2- Seat adjusting connecting rod

2.2 Optional Accessories

If necessary, users can contact BBR customer service for the following optional accessories and their price when purchasing the product.

2.2.1 Squatting exercise module

Some models support the squatting exercise module to offer users interactive game experience for squatting exercise. The module consists of feedback sensor for swing arm position, squatting exercise software system and smart flat TV.



NOTICE

- The smart flat TV need be prepared by users or provided by BBR with the following system requirements:
 1. 27 inches or 55 inches;
 2. Android 4.0 or higher version;
 3. Internal memory 2G;
 4. Bluetooth 4.0 or higher version.

2.2.2 Inclined Achilles tendon drawing module

Some models support the expansion of inclined plate Achilles tendon stretching module, which is mainly used to provide users with Achilles tendon stretching exercise. Users can adjust the angle of inclined plate according to their own needs.

2.2.3 Balancing exercise module

Some models support the balancing exercise module to offer users interactive game experience for balancing exercise. The module consists of sensor for plantar pressure, Achilles tendon exercise software system and smart flat TV.

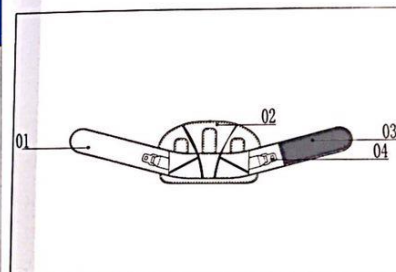


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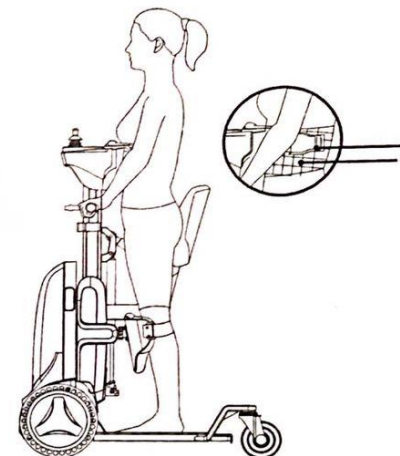
- The smart flat TV need be prepared by users or provided by BBR with the following system requirements:
 1. 27 inches or 55 inches;
 2. Android 4.0 or higher version;
 3. Internal memory 2G;
 4. Bluetooth 4.0 or higher version.

2.3 Wearables

Wearables are optional accessories, which can be used to fix and support the waist when users sit and walk on their feet. The inserts on both sides of the belt are connected and fixed with the upper support module safety clamp of the equipment itself.



- 1 - Waistband
 - ◆ Around waist of the user;
- 2 - Insert
 - ◆ Couple with safety clips on the both sides of the chest support to connect the waistband with the BBR;
- 3 - Velcro
 - ◆ Fasten the waistband;
- 4 - Waist backing strip
 - ◆ Support back of the user and connect with the waistband (detachable).



- 1 - Insert
- 2 - Safety clip

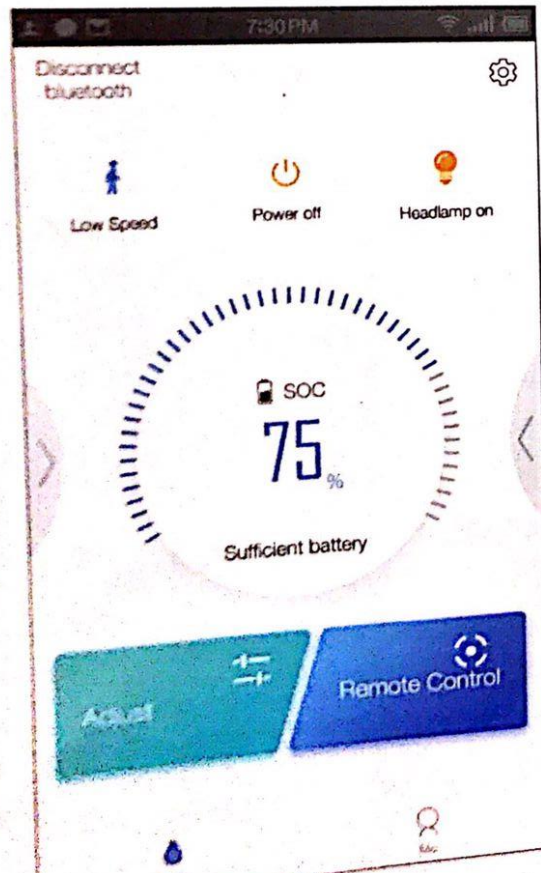


NOTICE

- Wearables is an optional accessory. Users with powerful upper body can not wear it. Whether users need to wear, please judge according to own situation or consult doctor's advice!

APP (BBR) can be connected with the BBR via bluetooth and currently supports Android and IOS system. Main functions include:

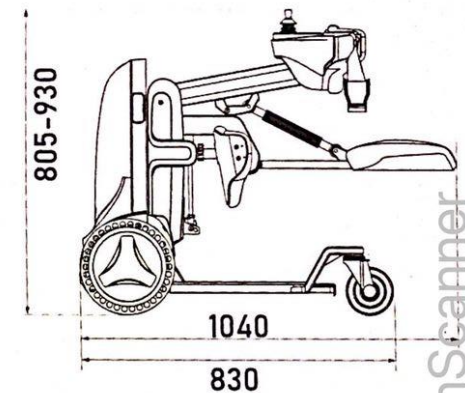
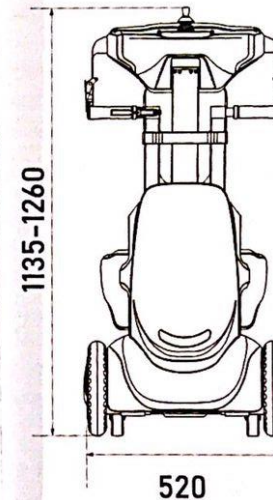
1. Remotely control the device;
2. Offer feedback on using status of various functions;
3. Configure and set parameters of all the electronic control modules;
4. Remotely update software of the BBR.



3. Technical Parameters

3.1 Dimensions

Height of the BBR is adjustable. The dimensions are as follows:



3.2 Performance

Item	Parameter
Maximum Speed	4.5 Km/h
Driving Distance Range	Under 25 °C , 15 Km with an even speed on even ground
Maximum safe slope	5°
Height of obstacle	≤ 40 mm
Width of trench	≤ 50 mm
User's height	1.5m - 1.9m
User's weight	40kg - 130kg
Minimum turning Diameter	0.63 m
Weight of the equipment	85 kg ±3 kg
Maximum load	100 kg
Bluetooth	2.4GHz 1mW
Power input of the Robot	DC 29.4V 4A
Power input of the charger	AC 220V

4. How to Use

4.1 Preparations

4.1.1 Instructions For Use

Before using the BBR (installing, operating, maintaining and checking etc.):

Make sure to carefully read the Product Manual. We'll understand all the equipment knowledge, safety knowledge and reminders before proper use.

In order to explain detailed parts, illustrations included in the Product Manual may describe them with the casing and the protective cover concealed. When using the product, do not dismantle the casing or the protective cover; otherwise, warranty service will be impaired. Please strictly follow the Product Manual to use the product.

In the need of re-purchase due to damage or loss of materials, please contact the distributor or BBR customer service.

4.1.2 Functions Of The Control Panel

Located right above the chest support, the control panel consists of indicator lights, function keys, joystick and main power switch.



01 - Ring-shaped indicator light

- ◆ a. Green for driving mode
- ◆ b. Blue for lock mode
- ◆ c. Flashing black and blue for pushing mode
- ◆ d. Red for rocker abnormality
- ◆ e. Purple for exercising

02 - Speed indicator light

- ◆ a. On for high speed
- ◆ b. Off for low speed

03 - Bluetooth indicator

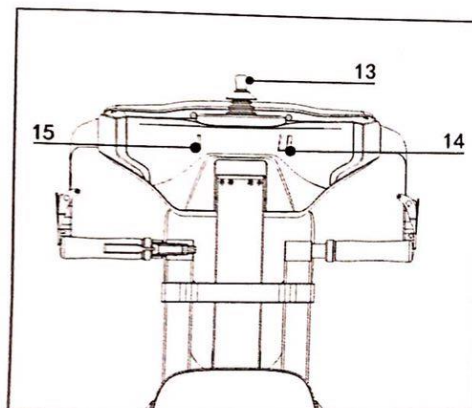
- ◆ a. Flashing for being un-connected
- ◆ b. On for being connected

04 - Battery indicator light

- ◆ Each grid for 20% power;
- ◆ Flashing for charging.

05 - Speed key

- ◆ Switch between high and low speed.



06 - Downhill Mode key

- ◆ press to entry or exit downhill mode
- ◆ SOS function is the function of selection. After selection, press for 3 seconds for the call for-help mode.

07 - Extension key, temporarily no function

08 - Extension key, temporarily no function

09 - Lock key

- ◆ Start the lock mode of the BBR to lock functions of the rocker.

10 - Switch key

Long press for 3s for start or standby of the BBR.

11 - Selection function key

Some models are equipped with electric upper lift, which is used to control the electric upper lift. 11 buttons are used to increase the upper height, 12 buttons are used to reduce the upper height.

12 - Selection function key

13 - Joystick

- ◆ Move the joystick to control the driving direction of the BBR.

14 - Power switch

- ◆ Main power switch of the BBR for emergency braking and failure restart.

15 - USB interface

- ◆ Output 5V/2A power exclusively for USB cell-phone charging.

4.2 Ergonomic Adjustment

Pre-use adjustment of the device includes adjustment of modules.

Adjustment of modules

Based on ergonomic design, module adjustment can adapt the BBR to users with different heights and weights:

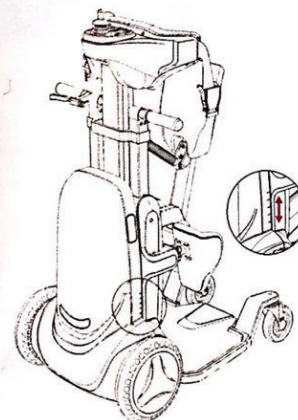
1. Height adjustment of the upper frame module
2. Length adjustment of seat connecting rod
3. Adjustment of height, width, extension length and angle of leggings

4.2.1 Height Adjustment Of The Upper Frame Module

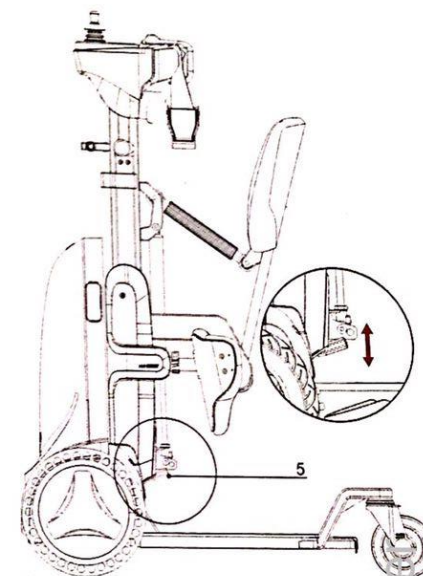
The upper frame module connects the handrails, swing arm and chassis. Users can manually adjust its height to adapt to half length of different users.

◆ Adjustment standard

Refer to the Table for the Upper Frame Adjustment.



◆ Adjustment steps



NOTICE

Table for Upper Frame Adjustment

Height /cm	Scale mark
150-155	0~1
155-165	1~2
165-175	2~3
175-185	3~4
185-190	4~5

- Marks in the table are for reference. Users should make adjustments according to their own conditions.

A technical line drawing of a motor vehicle chassis, viewed from the side. The drawing shows the engine, transmission, and various mechanical linkages. A red double-headed vertical arrow is positioned on the left side of the chassis, indicating the vertical range of motion for the front suspension components.

- 
- CAUTION

-
- A technical diagram of a mechanical assembly. It features a cylindrical component labeled '1' and a bracket-like component labeled '2'. Red arrows indicate the degrees of freedom: horizontal movement for part 1 and vertical movement for part 2. The assembly is mounted on a base plate with several screws.



-
- A technical line drawing of a door handle assembly. The handle is mounted on a door frame. A red dimension line indicates a distance of 3cm from the center of the handle to the edge of the door frame.



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4.3 Instructions For Use

4.3.1 Getting On The BBR

Step 1: Wear the wearables and conduct check.

1. Wear the waistband around the waist and stick it.
2. Use the APP (Install the APP for detailed usage) to remotely control the BBR to 30cm ahead of the body (the swing arm should be laid flat and users can operate the joystick with hands).
3. Put the foot on the rear wheel suspension girder and buckle the waistband into the safety clip.



CAUTION

- Before using, make sure that the waistband, safety clips, are intact and intact, and confirm that the electricity is sufficient.

Step 2: Transfer to the seat, tighten the waistband, and tie the legging binding band.

1. Use upper limb strength or assistance to transfer the buttocks to the seat.
2. Tighten the waistband on the both sides.
3. Tie the legging binding band.



CAUTION

- When tightening the elastic band, hold the upper support with one hand and tighten the binding band with safety clip with another.
- Ensure the lower leg lean against the kneecaps.
- Ensure the waistband are firmly connected.
- Wearables is an optional accessory. Users can make the choice according to their upper limb function or consult professionals' advice!

Step 3: Stand up.

1. Open the protective device of swing-arm control brake with right hand, pull the body to the upright position with upper extremity strength and with the help of booster and then let go the swing-arm control brake to finish the process of standing up.
2. After standing up, adjust to feel comfortable as much as possible.

4.3.2 Driving The Robot

After standing up and unlocking, the user can operate the joystick to drive the BBR forwards/backwards or make turns.



CAUTION

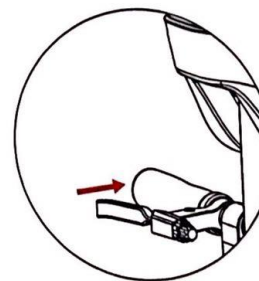
- Do not drive the BBR in a non-upright status (excluding downhill conditions).
- Try to drive with a low speed prudently. Bear in mind safety.

4.3.3 Switching The Body Position

◆ Operation steps

1. If the user need switch from standing to sitting temporarily, open the switch of swing-arm control brake, apply the swing-arm control brake with right hand, slightly push forwards with both hands and pull the swing arm to swing downwards with gravity force of the body.

2. When the swing arm swings downwards to the proper position, let go the swing-arm control brake and the swing arm is locked. If the user need stand up again, apply the swing-arm control brake with right hand and pull the body to the highest position with the strength of upper extremity and the help of booster to finish standing up. After standing, let go the swing-arm control brake.



Switch Of Body Position

4.3.4 Getting Off The Robot

◆ Operation steps

1. Drive the BBR to the target position.
2. Press the switch key  on the operation panel and lock the joystick control to avoid danger caused by accidental touch.
3. Apply the swing-arm control brake with right hand, slightly push forwards with both hands and resort to the gravity center of the body to sit down slowly.
4. Open the wearable safety clips (hold the supper support module with one hand and open the safety clips with another to prevent falling down).
5. Transfer the user away from the seat with upper limb strength or assistance from others.
6. Move the BBR forwards and take the feet out. The user now can get off the BBR.



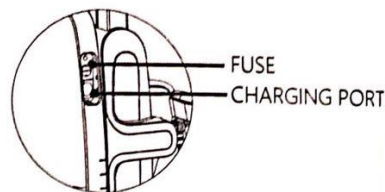
CAUTION

- After the user leaves the robot, the seat should be placed horizontally so that it can be used next time.
- Users who wear optional accessories without wearable them may skip step 4.
- When the BBR is kept vacant, do not apply the swing-arm control brake to prevent the swing arm from bouncing up without resistance and causing accidents.

4.3.5 Charging The Battery

Charging of the battery takes 4-6 hours. When the battery light on the control panel indicates one grid, it's a must to charge the BBR. Full grids indicate full battery.

Battery of the BBR is displayed on the APP synchronously.



◆ Operation steps

1. Open the rubber cover on the left front of the BBR.
2. Plug in the power adapter to charge the battery.



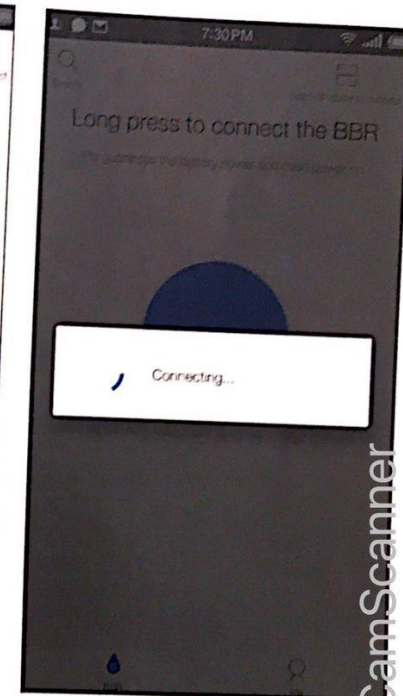
CAUTION

- Turn off the main switch when charging the battery.
- When using the BBR for the first time, fully charge it first.
- If the BBR is kept vacant for a long period, ensure to fully charge the battery at least one time a month.
- In the case of low battery of below one grid(20%), the BBR will give the alarm sound "Low battery. Please charge the BBR". Please charge it as soon as possible.
- Ensure to use chargers of brand, specifications and type specified by BangBang.

4.4 Instructions For APP

4.4.1 Getting Close For Connection

◆ Operation steps



Waiting for connection

1. Open the APP and click the navigation bar at the bottom to enter the "BBR" page.
2. Long press the circle button in the middle of the page.
3. Keep the mobile phone close to the head of the BBR to be connected.
4. Wait for a moment and the APP will automatically connect the target BBR.

