

# **Hip-Assist Exoskeleton**

## **User's Manual**

**2025 Dec**

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# 1. Important Safety Tips

## Important Note

1. The Hip-Assist Exoskeleton is a non-medical walking aid device. It is not intended to provide diagnostic, therapeutic, or preventive medical functions, nor does it offer body weight support, independent ambulation capability, or balance maintenance.

This device cannot prevent falls, treat medical conditions, restore physical functions, or relieve pain. It is not a substitute for professional medical equipment or clinical recommendations.

Users with medical needs are advised to use registered medical devices under the guidance of a qualified physician.

2. Prior to using this product, users must undergo a professional assessment—for the purposes of this user manual, the term "professionals" refers specifically to the following individuals who hold valid professional qualifications within the territory of China: licensed physicians, rehabilitation therapists, licensed nurses, senior health management professionals (Level III or above), sports rehabilitation therapists, licensed Traditional Chinese Medicine (TCM) practitioners, TCM specialists, and TCM rehabilitation technicians. Such professionals must also have a scope of practice that matches their registered field.

This assessment is mandatory to confirm that the user has no contraindications, including severe osteoporosis, joint deformities, acute inflammation, uncontrolled cardio-cerebrovascular diseases, and epilepsy. Should any of these contraindications be diagnosed while the product is in use, users must immediately cease use.

3. If the user has mild motor dysfunction (e.g., arthritis, early-stage Parkinson's disease), use of this product must be supervised by a qualified professional.

4. This product is contraindicated for the following groups of users:

- Individuals with cognitive impairment or severe balance disorders;
- Users with any contraindications specified in the product instructions, or those with cardio-cerebrovascular diseases or other conditions that may be exacerbated

by product use;

- Users whose physical parameters fall outside the product's recommended design range;
- Individuals who have not undergone and passed a professional assessment prior to use;
- Users with moderate to severe muscle spasms;
- Individuals with acute physical illness or mental confusion;
- Users with severe visual or cognitive impairments that may compromise safe operation of the device;
- Patients advised to observe absolute bed rest by a qualified physician;
- Pregnant women and minors;
- Users with severe lower limb movement limitations caused by muscular, ligamentous, or joint disorders;
- Users with unhealed fractures, abnormal musculoskeletal structure, or severe osteoporosis;
- Patients with pressure sores, ulcers, or open wounds on body areas that may come into contact with or rub against the device;
- Any other individuals deemed unfit for use based on their physical condition.

For your safety, the Hip-Assist Exoskeleton is designed with multiple safety protection mechanisms to ensure that you can use it safely in normal environments.

To avoid accidents, please follow the following requirements:

### **Caution**

1. Do not use the Hip-Assist Exoskeleton near water, fire sources, strong magnetic fields, high-voltage electricity, or in extreme temperature environments.
2. In case of an emergency, turn off the switch located on the lower right side of the device.
3. Power off the device before charging.
4. Do not plug or unplug the power cord with wet hands during charging to avoid electric shock.
5. After removing the device, wear appropriate footwear and allow time to adapt to the absence of assistance to prevent walking instability.

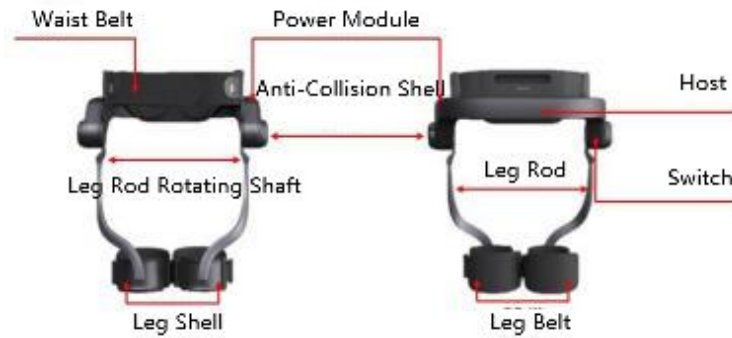
6. Do not expose the battery to direct sunlight or open flames.
7. Prevent battery short circuits.
8. Do not disassemble or subject the battery to deformation.
9. Do not submerge the battery in water.
10. Never charge the battery with a faulty charger.
11. The continuous charging duration shall not exceed 24 hours.

## 2. Overview

### 2.1 General Description

This manual is applicable to the Hip-Assist Exoskeleton product.

### 2.2 Appearance Structure



### 2.3 Operational Principle

The integrated processor and multi-sensor enable real-time monitoring of the user's motion status. The processor fuses data from the sensors to interpret the user's movement intent, and then actuates the dual motor modules to output power for driving lower limb motion.

During locomotion, the hip joints of both legs alternately deliver hip flexion torque and hip extension torque, whose coordinated operation ensures walking stability. Hip flexion torque facilitates thigh elevation and forward stepping; upon foot strike, hip extension torque drives hip and knee extension, enabling the body to push against the ground rearward and generate forward propulsion.

By means of dual motor modules to alternately apply hip flexion and extension torques to the lower limbs, the exoskeleton mimics the natural human gait. This design not only enhances lower limb mobility, but also alleviates physical exertion during walking.

### 2.4 Main Features

- Ergonomic design with lightweight for wearing comfort
- Intelligent sensing of human motions
- Dual-side replaceable batteries for extended working time
- High power, stable and low-noise operation, supporting assistance for leg lifting and kicking
- Easy to wear, with adjustable waist belt and leg strap
- Support outdoor use, do not get wet

### **3. Application Scenarios**

It is suitable for multiple application scenarios such as home ambulation, park walking/jogging, and outdoor hiking which helps you walk more briskly and effortlessly.

#### **3.1 Home Ambulation**

It helps lift the thighs and facilitates forward stepping, enabling users to walk with ease.

#### **3.2 Elderly Assistance**

It effectively reduces the physical burden on the elderly during walking, provides appropriate power assistance to facilitate leg lifting and forward stepping, enhances walking stability and prevents falls. It significantly improves the gait of the elderly, ensures easier and safer daily ambulation, and elevates their quality of life.

## 4. Wearing Procedure

### 4.1 Wearing

#### 4.1.1 Preparation

- (1) Place the shoulder strap face up;
- (2) Hook the end of the shoulder strap to the side and rear fixing holes of the waist belt.



#### 4.1.2 Wearing

- (1) Put the shoulder strap on shoulders and adjust the length of the back strap to position the Exoskeleton around the waist.
- (2) Lift the device up and down by hand to ensure that it is at a proper height. (Height standard: Align the center of the power rotation module with the center of the wearer's hip joint rotation.)
- (3) Fasten the chest strap and adjust it to a comfortable length.
- (4) Adjust the shoulder straps to a proper length.





#### 4.1.3 Tighten Waist Belt

- (1) As shown in the figure below, fasten the inner waist belt tightly.
- (2) Pull out the outer elastic Velcro strap, tighten it and stick it to the inner waist belt. The ideal fit is fully snug and slightly tight.



#### 4.1.4 Tighten Thigh Strap

- (1) As shown in the figure below, place the thigh shell on the front of the thigh, wrap the thigh strap around the back of the thigh, and fasten the buckle.
- (2) Grasp the thigh strap on both sides and pull backward to adjust the length. The ideal fit is fully snug and non-loosening.



**Note: The thigh strap must be fastened. If it is loose, the leg rod may bounce up, which may cause injury.**

## 4.2 Taking-off

**Note: Before taking-off the equipment, make sure it has been switched off, otherwise the leg rod may bounce up and cause injury.**

- (1) As shown in the figure below, unfasten the buckles on the outer side of the legs and unfasten the thigh straps.
- (2) Unfasten off the elastic Velcro strap on the outer side of the waist first, and then unfasten the inner waist belt.
- (3) Unfasten the chest strap.
- (4) Take off the shoulder straps and remove the device at the same time.





**Note: Before taking-off the equipment, please keep the equipment properly to prevent damage caused by falling.**

## 5. How To Use

### 5.1 Control Button

#### 5.1.1 Power Switch

The power switch is located on the lower right side of the host unit (see figure below). When the switch is upward, the Exoskeleton will shut down. Pressing the switch to downward will start the device.



#### 5.1.2 Mode Switch

The mode switch is located above the left side, as shown in the figure below.



### 5.2 Switch on/off

Push the power switch as for 5.1.1 to switch on/off the equipment.

### 5.3 Mode Switch

The assist modes are divided into Walking Assist Mode (left indicator turns **green**), Elderly Assist Mode (left indicator turns **purple**, suitable for the elderly with small strides and slow leg-lifting speed), Follow Mode (left indicator turns **cyan**). The corresponding indicator colors are shown in the table below.

<b>Mode</b>	<b>Indicator Color</b>
Walking Assist Mode	Green
Elderly Assist Mode	Purple
Follow Mode	Cyan

The mode switch button can be used to switch among Walking Assist Mode, Elderly Assist Mode and Follow Mode. Press and hold the button for more than 1 second to switch the assist modes. The device will default to Walking Assist Mode upon power-on. The mode switching sequence is: Walking Assist Mode → Elderly Assist Mode → Follow Mode → Walking Assist Mode.

## **5.4 Gear Switch**

Press the mode switch button briefly to adjust the level of assistance. The default mode is Walking Assist Mode, with a maximum of 3 gears adjustable via the button. For Elderly Assist Mode, the button also allows a maximum of 3 gears of adjustment, while Follow Mode defaults to Gear 1.

Double-click the mode switch button briefly, and the battery level will be displayed (indicated by the number of white indicator lights). When the battery level is below 25%, only one orange indicator light turns on as a low-battery alert.

### **Caution**

1. Do not walk while switching the device on or off.
2. After startup, the device will perform a 2-second calibration during which the motor will swing back and forth. You can start walking normally once the swing stops.
3. The power modules on both sides will generate slight heat during normal use. This is a normal phenomenon, please do not worry.
4. Do not walk when adjusting the level of assistance during use, to prevent loss of balance and falls caused by sudden changes in assistance.
5. Always make sure the device is turned off before unfastening the thigh strap. Otherwise, leg rod may bounce up and cause injury.

## 6. Maintenance

### 6.1 Charging

The charging ports are located on the lower rear side of the device. The charging process is illustrated in the figure below.

- (1) Locate the two charging ports on the lower rear side.
- (2) Insert the DC connector of the charger into the port and connect it to a 220V mains supply.
- (3) During charging, the charger indicator light is red. When charging is complete, the indicator light turns green.



#### Caution

Using a non-specified charger may damage the battery or even cause a fire.

### 6.2 Equipment Cleaning

#### 6.2.1 Fabric Cleaning

- (1) Wipe the waist belt, waist belt lining and thigh straps with a damp (non-dripping) cloth to remove dust and dirt.
- (2) Then disinfect the waist belt, waist belt lining and leg straps with alcohol wipes.

#### 6.2.2 External Surface Cleaning

- (1) Wipe the main unit, waist rods, waist belt, power components, leg rods and other parts of the equipment with a damp (non-dripping) cloth.
- (2) Then wipe the main unit, waist rods, waist belt, power components, leg rods and other parts of the equipment with alcohol wipes.

**Caution**

Do not rinse or soak the device with water during cleaning to avoid damage to the equipment.

## 7. Technical Specifications

<b>Battery capacity</b>	1100mAh*2
<b>Working temperature</b>	-10°C~45°C avoid exposure to rain
<b>Maximum speed</b>	9km/h

## 8. Common Troubleshooting

Fault	Cause	Solution
The device cannot be turned on.	Out of charge	See 6.1
The 4 orange indicator lights breathe with a 1-second on-off cycle.	Lack charge	See 6.1
The 4 orange indicator lights breathe with a 1-second on-off cycle.	Binding Detachment/ Strap Disengagement	Turn off the equipment and re-wear.
Leg rod squeaks	Abnormal noise caused by bushing friction	Apply grease or spray lubricating oil to the rotating shaft of the leg rod