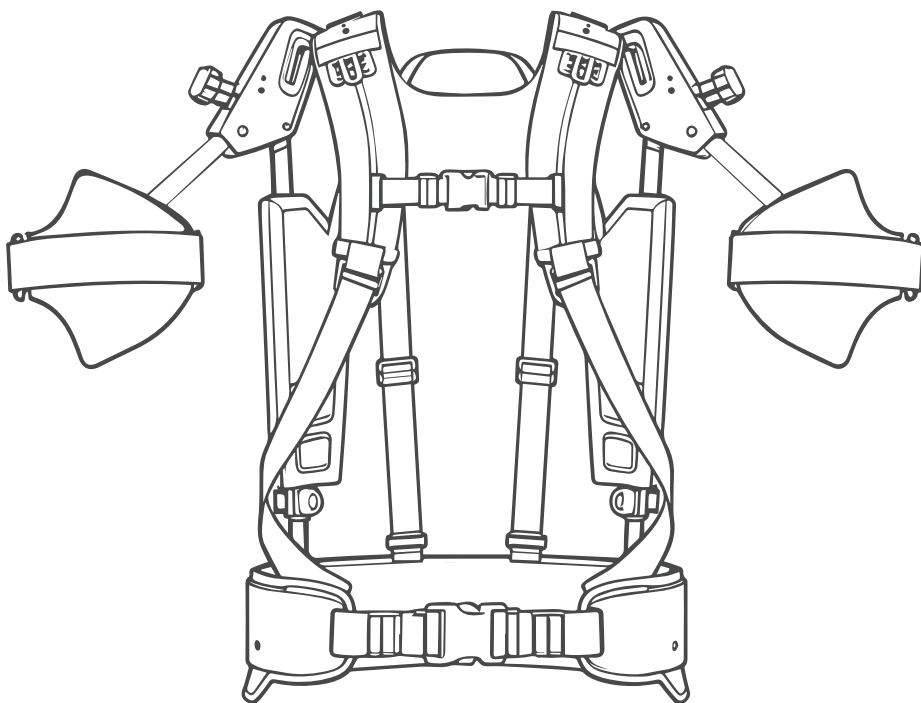


Passive Upper-Limb Exoskeleton

User Manual

[V1.0 Apr. 2026]



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Preface

Legal Liability and Disclaimer

This manual describes the installation, adjustment, operation, cleaning, and maintenance methods for the passive upper-limb exoskeleton produced by our company, model: PaExo-SD1000 (hereinafter referred to in this manual as "the exoskeleton"). Our company shall not be held liable for any misuse arising from the user's failure to comply with the operating and maintenance instructions provided herein, nor for any accident caused by repairs carried out by technicians not certified by our company.

By using this product, you acknowledge that you have read, understood, and accepted the terms and conditions set forth in this document, and you agree to operate the product in strict accordance with all usage instructions.

To the fullest extent permitted by law, our company's liability shall be limited to repairing or replacing, in accordance with the exoskeleton's effective warranty policy, any product confirmed to have defects in material, workmanship, or design. Notwithstanding the foregoing, nothing in this clause is intended to exclude or limit any liability of our company that is imposed by applicable law and cannot be restricted by agreement.

Our company assumes no responsibility for any consequences arising from the use of unofficial licensed third-party accessories or unauthorized modifications to the product. This product is warranted against defects in materials and workmanship for one year from the date of manufacture. The following situations are not covered under this warranty:

1. Routine maintenance or situations where the one-year warranty period has expired;
2. Damage caused by improper handling, such as damage occurring during transportation or movement;
3. Damage caused by fire, earthquake, flood, or other natural disasters.

During the warranty period, any component with a quality defect, except under the circumstances mentioned above, can be replaced for the user free of charge.

Statement

Our company shall not assume any responsibility for personal injury or property damage caused by the following reasons:

1. Malfunctions or damage resulting from incorrect operation;
2. Malfunctions or damage caused by the use of parts not specified by our company during modification or repair;
3. Malfunctions or damage caused by failure to observe the operating precautions or instructions provided in this manual;
4. Malfunctions or damage caused by repairs carried out through unauthorized dealers or maintenance service providers;
5. Malfunctions or damage resulting from reckless or improper alterations.

Our company requires that users inspect the complete performance of the product before formal use, and thereafter at least once every six (6) months. This manual shall be kept together with the exoskeleton for easy reference at all times. In the event of any technical problems, please contact your local distributor or our company's after-sales service department.

Important Notes for Users

Instructions regarding safety precautions and warnings are clearly specified in this manual. Please read them carefully before operation and correctly operate this exoskeleton in accordance with the relevant information.

 **PROHIBITION:** Indicates a hazardous situation which, if not avoided, could result in serious personal injury.

 **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor injury or damage to the equipment.

 **NOTICE:** Highlights important information or useful tips that do not involve risk of personal injury or equipment damage.

PROHIBITION

1. Do not mix or use with non-matching equipment;
2. Do not use the exoskeleton beyond its designated range of motion;
3. Do not use the exoskeleton when experiencing excessive fatigue or physical pain/injury, as this may increase physical strain;
4. Do not modify this product in any way without authorization. This includes, but is not limited to, disassembly, replacement of key components, or alteration of the mechanical structure.

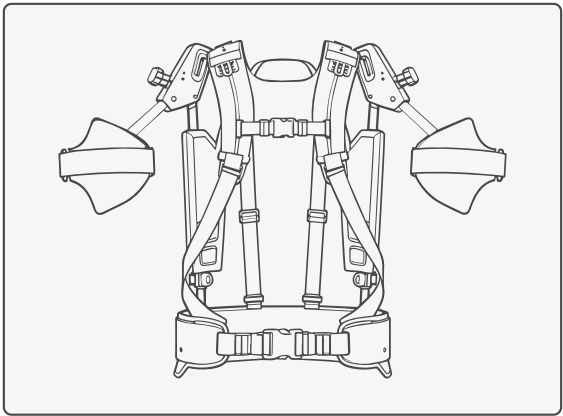
CAUTION

1. Some components of the exoskeleton are made of plastic. Do not disassemble or use with excessive force to avoid damage to the components.
2. If you notice abnormal loosening or unusual sounds during use, stop using the product immediately.
3. Wear the exoskeleton correctly. Improper wearing may prevent the product from functioning properly or cause personal injury.

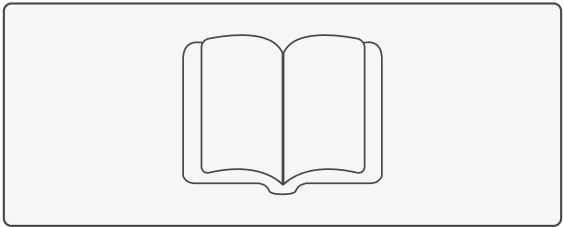
NOTICE

1. Assemble and disassemble the exoskeleton strictly in accordance with the instructions provided in this manual.
2. Before use, ensure that the exoskeleton's adjusted size matches the wearer's body size.
3. When using this exoskeleton for the first time, you may experience some discomfort. Please first become familiar with its functions and gradually adjust to its assistive effect on the body.

In The Box



Body Structure × 1



User Manual × 1

Product Overview

Diagram

The exoskeleton mainly consists of a harness system, a waist support structure, and supporting linkages, as shown in Figure 1:

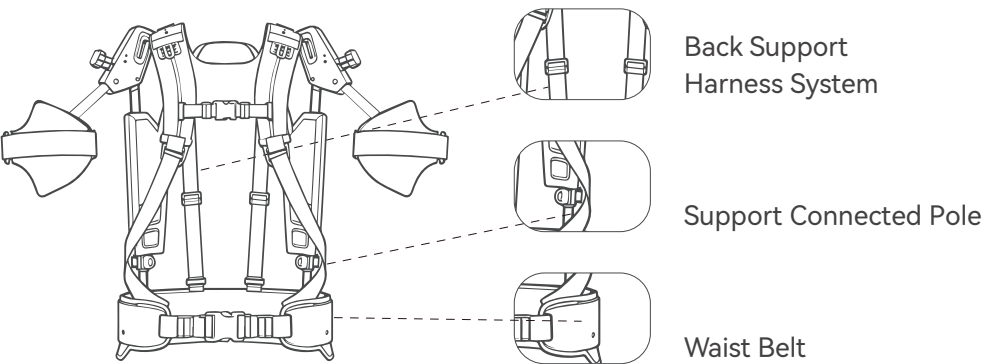


Fig. 1 Exoskeleton Structure Diagram

To accommodate users of different body types, the exoskeleton is equipped with multiple adjustment mechanisms. The adjustment structures of each part of the exoskeleton are shown in Figure 2:

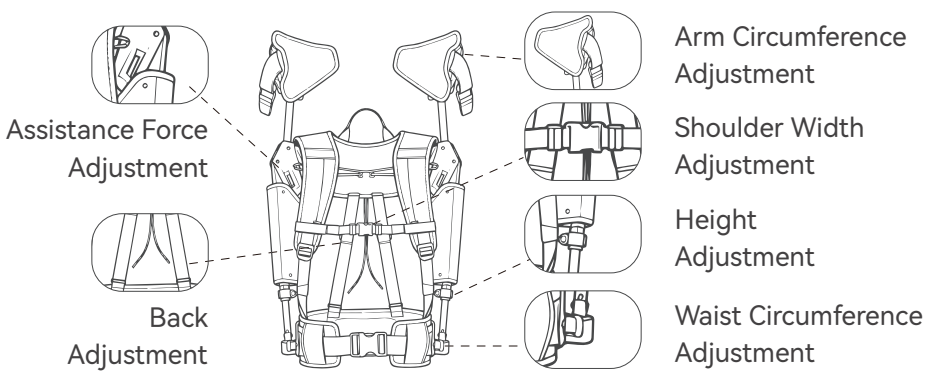


Fig. 2 Exoskeleton Adjustment Diagram

Arm Circumference Adjustment: Adjust the elastic strap to fit different arm circumferences.

Height Adjustment: Unlock the adjustable link to change the height, accommodating users of different statures.

Waist Circumference Adjustment: Pull up the spring-loaded pin to adjust the waist belt position, fitting different waist circumferences.

Back Adjustment: Slide the slider buckle to adjust the fit of the harness, accommodating different torso lengths.

Assistance Force Adjustment: Rotate the knob to adjust the support force level of the exoskeleton.

Shoulder Width Adjustment: Adjust the length of the elastic strap via the buckle to fit different shoulder widths.

Technical Specifications

Exoskeleton Specifications

Product Name	Passive Upper-Limb Exoskeleton
Model	PaExo-SD1000
Net Weight	1.9kg
Maximum Assistive Capacity	5kg
Effective Assistive Range	Arm lift angle: -30° to 60°
Total Donning and Doffing Time	≤30s
User Height Requirement	160 ~ 190cm

Donning and Doffing

Exoskeleton Adjustment

1. Height adjustment: Open the buckle, adjust the length according to the user's height, and fasten the buckle to secure it. Repeat the above steps on the other side.

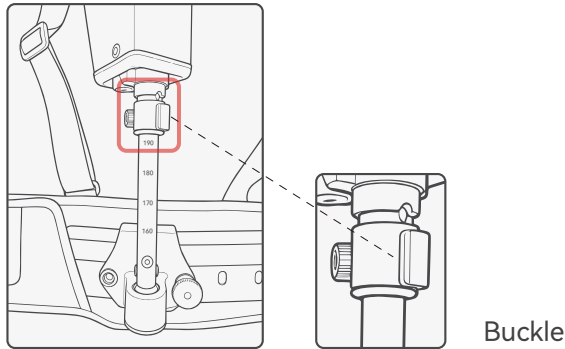


Fig. 3 Height Adjustment Illustration

2. Shoulder Width Adjustment: Open the Velcro on the back. Push upward on the protruding center part of the buckle to release it. Adjust the shoulder width according to personal needs by pressing both sides of the buckle and pulling downward. Tighten the elastic strap to decrease the shoulder width, or loosen it to increase the shoulder width. Once adjusted, move the buckle back to its original position, lock the buckle in place, and refasten the Velcro on the back.

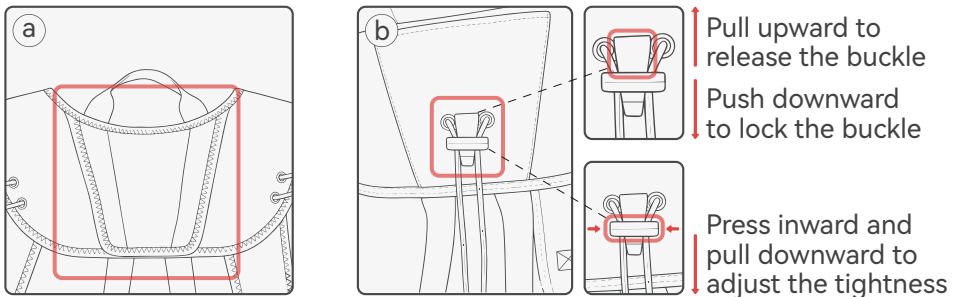


Fig. 4 Shoulder Strap Adjustment Illustration

3. Assistance Force Adjustment: Rotate the knob to adjust the assistance range according to the weight of the tool being used. Turn the knob counter-clockwise to increase the assistance range, and clockwise to decrease it. Repeat the same operation on both the left and right sides.

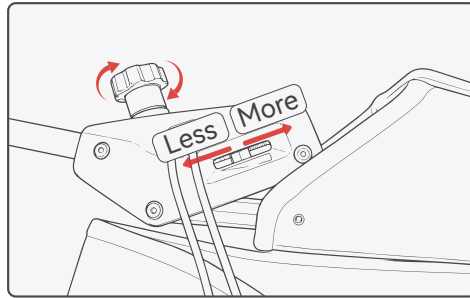


Fig. 5 Assistance Force Adjustment Illustration

Wearing the Device

Proper donning of the exoskeleton allows it to fully perform its intended functions without restricting the wearer's natural movement.

1. Putting on the exoskeleton: Put on the exoskeleton like a backpack.

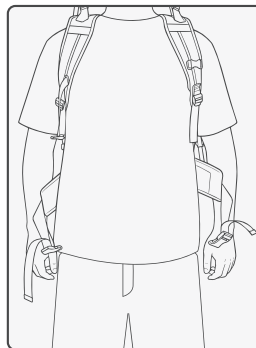


Fig. 6 Exoskeleton Donning Illustration

2. Waist fastening: Fasten the waist buckle and tighten the belt until it fits snugly against the waist.

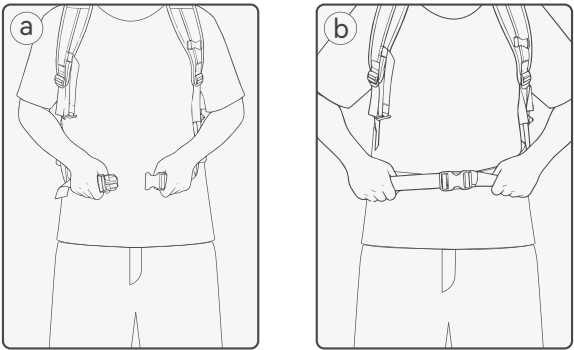
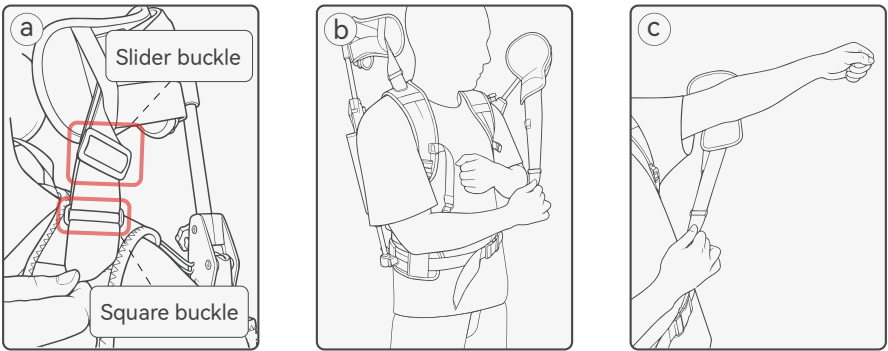


Fig. 7 Waist Belt Fastening Illustration

3. Armrest fastening: Open the Velcro on the arm strap and shoulder strap, and pull them downward. Place the arm into the armrest, then fasten the square buckle on the arm strap into the slot of the armrest (as shown in Figure d). Repeat the above steps on the other side. Tighten the shoulder straps, fasten the chest buckle, and tighten the chest strap. The final donning effect is shown in Figure f.



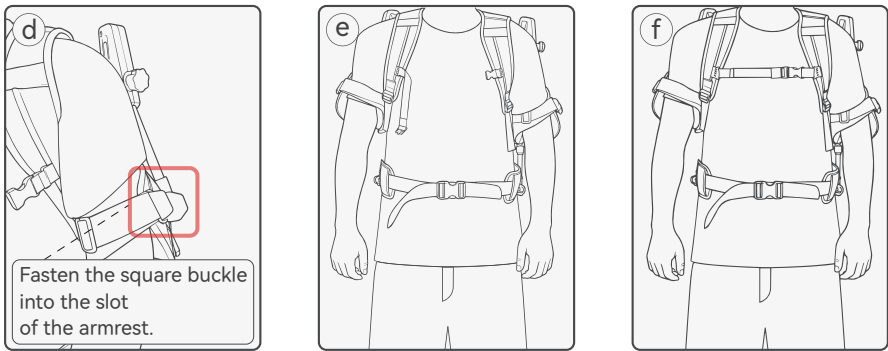


Fig. 8 Armrest Fastening Illustration

⚠CAUTION: When donning or doffing the exoskeleton armrest, firmly grasp the armrest Velcro to prevent the armrest from rebounding and causing personal injury.

Strap Adjustment

1. If the elastic strap of the exoskeleton arm strap is too loose or too tight to secure the armrest to the arm, adjust the length using the slider buckle on the strap to achieve proper fixation between the armrest and the arm.
2. If the shoulder strap causes discomfort at the back of the neck, adjust the webbing length to a suitable position using the slider buckle on the back harness.
3. If movement is restricted while wearing the exoskeleton, adjust the position of the waist buckle forward or backward using the waist belt latch pin to resolve the issue.

Taking Off the Device

1. Open the square buckle on the exoskeleton arm guards, then attach the square buckle to the Velcro on the shoulder straps for easy donning next time. Repeat the same steps for the other arm.
2. Unfasten the waist belt buckle and the chest buckle, then take off the exoskeleton.

Storing the Device

1. Neatly arrange the exoskeleton and place it into the grooves of the packaging box with the logo side facing up.
2. Close the box lid to complete the storage of the exoskeleton.

Maintenance and Storage

Regular Cleaning

Cleaning the Main Unit Structure

Please strictly follow the instructions below to clean the surface structure of the exoskeleton.

- ⦿ Gently wipe the main body with a soft, damp cloth.
- ⦿ Ensure the exoskeleton is completely air-dried before storing or using it again.

CAUTION

- ⦿ Do not use corrosive or volatile chemical solvents (such as alcohol, gasoline, diesel, or acetone) or any abrasive materials, as they may damage the device surface and internal components.
- ⦿ Do not use a pressure washer or high-pressure water gun to clean the main unit structure, and avoid exposing the device to pressurized or high-velocity water flow.

NOTICE

- ⦿ To ensure that the exoskeleton remains securely fastened during prolonged use, the waist rod and its adjustment buckle are designed with a tight-fit structure. Therefore, with extended use, shiny marks may appear on their surfaces due to friction. You can wipe these marks with a soft cloth dampened with 75% alcohol, then allow them to air dry naturally.

Cleaning Soft Fabrics

Please strictly follow the instructions below to clean the soft fabrics of the exoskeleton.

- ⦿ Wipe the surface of the soft fabrics with a soft, damp cloth and a mild detergent.
- ⦿ Ensure the soft fabrics are completely air-dried before storing or using the device again.

CAUTION

- ⦿ Do not use cleaning agents containing bleach or strong alkaline substances, as they may damage the soft fabrics.
- ⦿ Do not machine wash, as vigorous agitation may deform or damage the soft fabrics.
- ⦿ Do not tumble dry, and avoid exposing the soft fabrics to direct sunlight or high temperatures, as this may cause fading or deformation.

Replacing Soft Fabrics

Replacing the Armrest Strap

⦿ **Shoulder straps:** Open the Velcro at the connection point ① between the arm strap and the shoulder strap, then pull out the webbing attached at points ② and ③ of the armrest from the slots. Repeat the above steps on the other side to remove both shoulder strap.

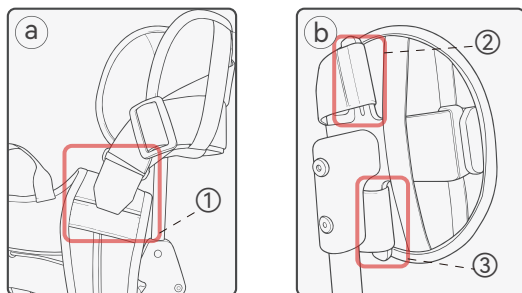


Fig. 9 Shoulder Strap

⦿ **Armrest strap:** Remove webbing ④ and ⑤ from the armrest, then pull the armrest out from the webbing at point ⑥. Repeat the same steps on both the left and right sides.

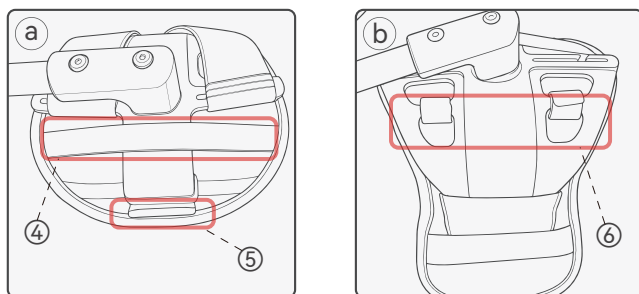


Fig. 10 Armrest Fastening

Replacing the Back Harness

⦿ Open the Velcro ⑦ on the back, pull the buckle upward to release it, and pull the elastic cords out of the buckle respectively to remove the buckle ⑧.

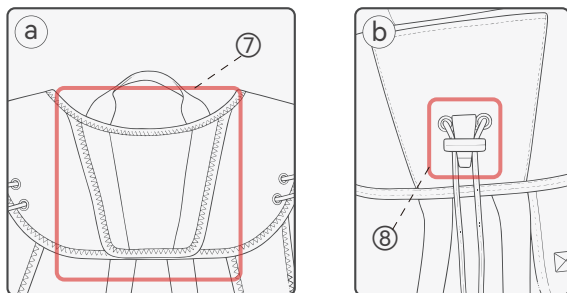


Fig. 11 Elastic Cord

⦿ Remove the webbing at points ⑨ and ⑩ from the waist fixing buckle, then the back harness can be completely taken off.

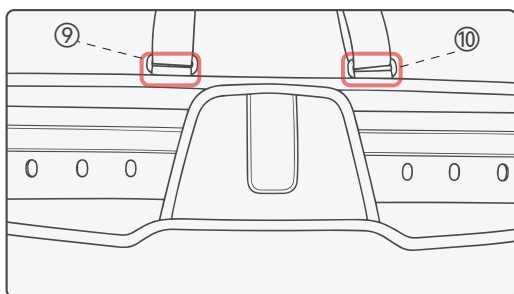


Fig. 12 Back Harness Webbing

Replacing the Cover

⦿ Use a hex wrench to loosen screws ⑪ on the left and right sides of the cover by turning them counterclockwise. Repeat this operation on the other side. Keep the screws properly stored to avoid loss.

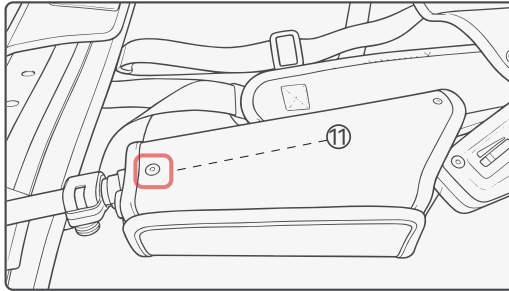


Fig. 13 Cover Screws

⦿ Open the Velcro on the cover, and detach the long strip of Velcro ⑫ inside the cover to remove the cover. Repeat the above steps on the other side.

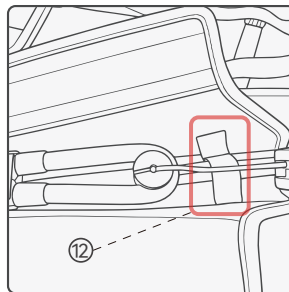


Fig. 14 Velcro Inside the Cover

Replacing the Waist Belt

⦿ Fold down the cover fabric ⑬ of the positioning waist belt, pull the latch pin ⑭ upward, and slide it toward the center of the waist belt. The latch pin assembly can be removed when it reaches the recessed area of the guide slot. Repeat the same operation on both the left and right sides.

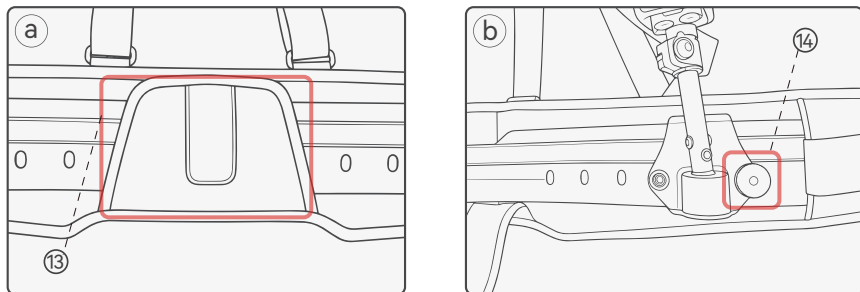


Fig. 15 Waist Belt

Storage and Transportation

Storage

Store the device in a clean, dry, and well-ventilated indoor environment.

- ⦿ Do not store the device outdoors, in direct sunlight, or in locations exposed to rain, dust, or moisture.
- ⦿ Keep away from extreme temperatures, open flames, and heat sources to prevent material aging.
- ⦿ Do not place heavy objects on top of the device to avoid deformation or mechanical damage.
- ⦿ For long-term storage, cover the device to protect it from dust accumulation and accidental impact.

Transportation

Before transport, ensure that the device is properly stored and correctly placed inside the box.

- ⦿ The exoskeleton complies with air transport standards and may be carried

on board as hand luggage. It is recommended that you consult the airline in advance regarding specific transport regulations.

⦿ During transport, ensure that the device and its accessories are protected from impact, vibration, and excessive compression.

⦿ If the packaging shows signs of damage, inspect the device before use to ensure safety.

Troubleshooting

Common issue 1: Arm guard slipping at the elbow.

⦿ Possible Cause: Arm strap not tightened.

⦿ Solution: Adjust and tighten the strap at the arm guard.

Common Issue 2: The knob cannot be turned after donning.

⦿ Possible Cause: The arm is hanging down, and the knob rotation is resisted by the elastic cord.

⦿ Solution: Raise or lift the arm to a horizontal position, then grasp the knob with your hand and adjust it

Common Issue 3: The exoskeleton arm linkage wobbles and the support force decreases after donning.

⦿ Possible Cause: The back elastic cord has not been tightened, causing the force to be dispersed.

⦿ Solution: Tighten the back elastic cord to the appropriate position and re-don the exoskeleton.

Common Issue 4: Friction is felt between the harness and the back of the neck after donning.

⦿ Possible Cause: The back webbing length has not been adjusted.

⦿ Solution: Use the slider buckle to adjust the webbing length by sliding it up or down.

Warranty Policy

This Warranty Terms (hereinafter referred to as "this Warranty") applies only to PaExo-SD1000 products purchased through official AlpWalk channels or authorized distributors.

What Is Covered

AlpWalk provides a limited warranty for the PaExo-SD1000 product against material or workmanship defects under normal use conditions.

This Warranty Policy covers malfunctions caused by quality issues during normal use and will repair or replace defective parts free of charge, excluding normal wear and tear. Consumable parts such as straps and elastic ropes (i.e., components that naturally wear or age during normal use) are not covered under this warranty.

The warranty period is one (1) year, commencing from the day after the date of product receipt by you. When requesting warranty service, you must provide a valid proof of purchase (such as a sales invoice, electronic receipt, or official order screenshot) issued by AlpWalk or its authorized distributor.

What Is Not Covered

This warranty does not cover the following situations:

- × Malfunctions or damage caused by human factors unrelated to product quality defects.
- × Damage resulting from unauthorized modification, disassembly, or opening of the housing not instructed in the official manual.
- × Damage caused by incorrect installation, use, or operation not in accordance with the instructions provided in this manual.
- × Damage resulting from self-repair of components without official guidance.
- × Damage caused by forced use of components that have already aged or become damaged.
- × Damage caused by compatibility or reliability issues arising from using third-party accessories not certified by AlpWalk.
- × Damage caused by exposure to high temperatures, negligence, fire, liquid ingress, or corrosion.

- × Man-made damage resulting from use beyond normal operating conditions, including but not limited to prolonged exposure of the product to hazardous environments (e.g., extreme temperatures or humidity, high dust levels, corrosive gases).
 - × Damage caused by force majeure events (e.g., fire, earthquake, flood).
 - × Products or components whose identification labels have been altered, removed, or damaged without authorization.
 - × Products for which valid proof of purchase cannot be provided, or which are beyond the warranty period.
- Other circumstances not expressly specified in this Warranty, for which AlpWalk has sufficient evidence to refuse providing warranty service.

What Will Void This Warranty

This warranty will become void under the following circumstances:

- × Unauthorized alteration of the product's hardware or firmware;
- × Unauthorized repair or modification of the product or its components without official authorization;
- × Use of the product together with non-original AlpWalk components or third-party accessories;
- × The product's warranty label, serial number, or anti-counterfeiting mark has been altered, removed, or damaged;
- × The product has been misused, improperly stored, or used for illegal purposes.

How To Obtain Warranty Service

You may contact AlpWalk official customer service to request warranty service through the following methods:

- Official Website: www.alpwalk.com
- Email: support@alpwalk.com

Authorized distributors other than AlpWalk's official channels may provide their own warranty services. If you purchased the product through an authorized distributor, please contact that distributor directly for further warranty information.

Limitation of Liability

AlpWalk shall be responsible for the loss or damage of the product only under the following circumstances: the product is in the possession of AlpWalk; or the product is in transit for which AlpWalk is responsible for shipping.

AlpWalk shall not be responsible for the loss or disclosure of any data contained in the product, including confidential information, proprietary information, or personal information.

Your Statutory Rights

This warranty statement grants you additional, specific rights. You may also have other statutory rights, which vary depending on the applicable laws of your country or jurisdiction. Nothing in this warranty statement affects those statutory rights that cannot be waived or limited by contract, including rights granted to consumers under laws or regulations governing the sale of consumer products.

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