



Hapo HD

Instruction manual

Original instructions

V.06.26

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Introduction

1. Purpose of the instruction manual

This instruction manual contains all the information and instructions necessary for the safe and correct use, adjustment, and maintenance of the Hapo HD.
Read it carefully and follow all instructions and recommendations regarding proper use and safety.
This manual is an integral part of the Hapo HD product. It must accompany the product in case of resale. The responsibility for keeping it complete and in good condition lies with the user.

2. Abbreviations and symbols

Table 1 : abbreviations

Abbreviations	Definitions
Hapo	Posture Harness
HD	Heavy Duty
DAP	Physical Assistance Device
Passive	Without external energy storage or power supply
PPE	Personal Protective Equipment

Table 2 : Meaning of pictograms

	General danger
	General obligation
	General prohibition

3. Revision history of the manual

Table 3 : Revision history

Date	Revision	Description
2026-06-16	A	Creation

HAPO HD Overview

4. General description

The Hapo HD is a lightweight, non-motorized physical assistance device operating with an artificial muscle. It is worn by an operator and assists hip extension and spinal extension movements, i.e., tasks involving bending forward and standing back up.

The Hapo HD can help relieve the user's back while maintaining an upright posture during lowering and lifting movements.



- The Hapo HD **is not a medical device**.
- The Hapo HD must be worn over clothing.
- The Hapo HD is not PPE.
- The Hapo HD must not be used in case of medical conditions unless medically advised.



- Do not use the Hapo HD during **pregnancy**.

5. Product identification

The Hapo HD has 2 labels:

- A sewn-in fabric label, located at the top rear of the product's shoulder straps.
- A traceability label attached to the back of the housing under the fabric pad.

These labels are an integral part of the Hapo HD and must remain permanently present, visible, and legible. It is strictly forbidden to remove, move, damage, cover, or modify them.

If a label is missing, unreadable, detached, or damaged, the Hapo HD must not be used until proper identification is restored. Contact the manufacturer or representative for a replacement label.

The information contained on the fabric label is shown in Figure 1 and Table 4.

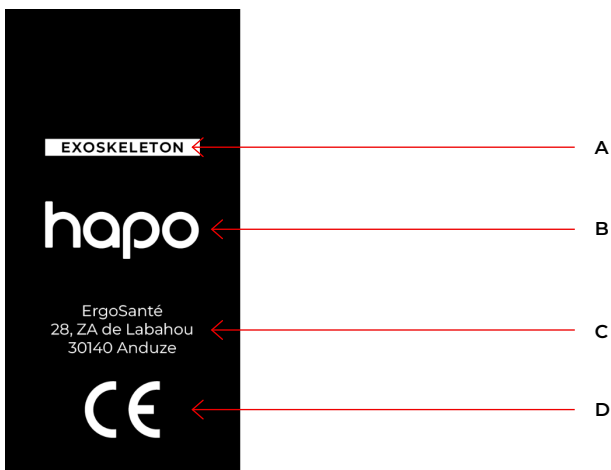


Table 4 : Information contained on the fabric label

Number	Meaning
A	Product type
B	Brand logo
C	Manufacturer name and address
D	CE marking

Figure 1 : Fabric label

The information contained on the traceability label is shown in figure 2 and table 5.
To access it, remove the fabric pad from behind the housing by unclipping the snap buttons.

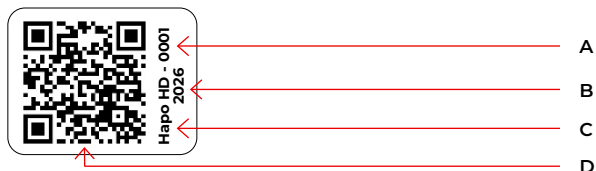


Figure 2 : Traceability label

Table 5 : Information contained on the traceability label

Number	Meaning
A	Serial number
B	Year
C	Product type
D	QR code

6. Manufacturer

ErgoSanté
Head office : 28 ZA de Labahou 30140 Anduze – France
+33 8 05 69 06 91 (cost of a local call)
contact@ergosante.fr

Hapo USA Corporation
Head office: 454 Kentucky Ave Dankville, KY USA 40422 – United States
contact@Hapo.us

7. Components

The physical assistance device Hapo HD is composed of the following elements (see figure 3 and table 6):

Shoulder straps [1] :

Breathable fabric shoulder straps featuring 4 rear adjustment slots to position the housing according to the user's body shape, and two front adjustment loops for adjustment/activation of the exoskeleton.

Housing [6] :

Housing containing the artificial muscle (spring blades) that provides physical assistance. This housing is positioned at the lumbar area using 3 straps. The upper strap allows morphological adjustment (torso length), and the two side straps allow adjustment of the housing position and activation of assistance. In the lower position, the housing includes two cords enabling force transfer to the thigh cuffs.

Fabric pad [7] :

Fabric component positioned between the housing and the user.

Thigh cuffs [8] :

Fabric component placed around each thigh, featuring 2 adjustment settings depending on length (3 slots to attach the cord) and circumference (2 cuff adjustment buckles [10]) of the lower limbs.

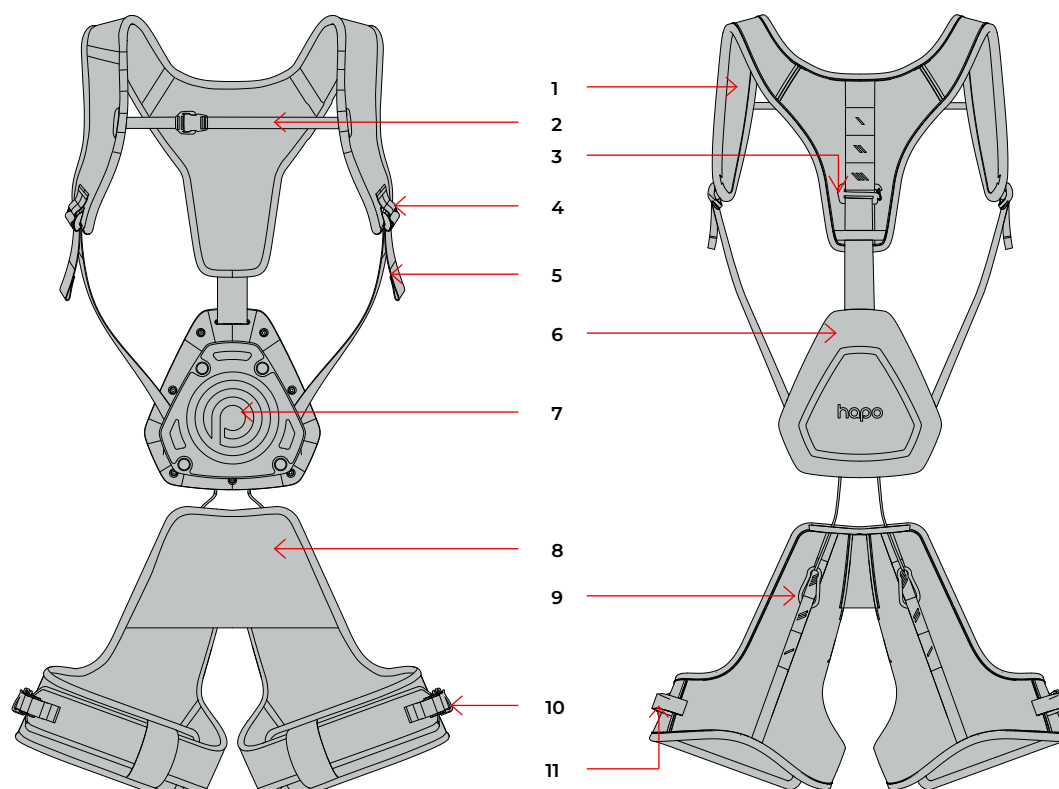


Figure 3 : Numbering of Hapo HD components

Table 6 : Hapo HD components

Number	Meaning
1	Shoulder straps
2	Chest strap
3	Adjustment buckle
4	Deactivation loop
5	Activation strap
6	Housing

Number	Meaning
7	Fabric pad
8	Thigh cuffs
9	Adjustment carabiner
10	Cuff adjustment buckle
11	Cuff adjustment strap

8. Operating principle

The Hapo HD is a **non-motorized physical assistance device using composite leafspring**.

It consists of two shoulder straps [1] worn over the shoulders, as well as a set of two thigh cuffs [4] wrapping around the thighs. These two assemblies are connected by a housing [2] functioning as an “artificial muscle”.

When the user bends forward, the artificial muscle is activated, providing physical assistance both for maintaining posture in a flexed trunk position and during trunk or hip extension, working in a similar way to the lumbar muscles.

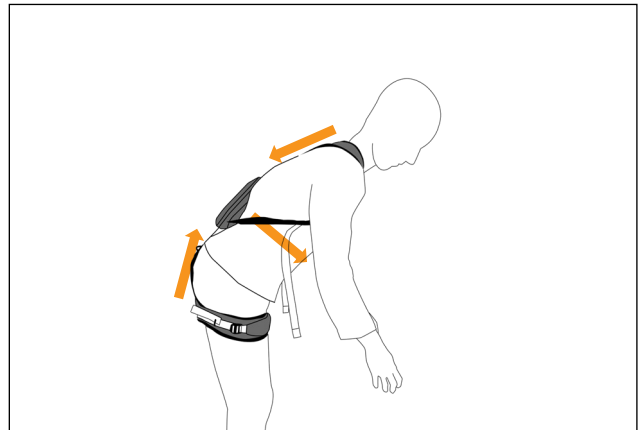
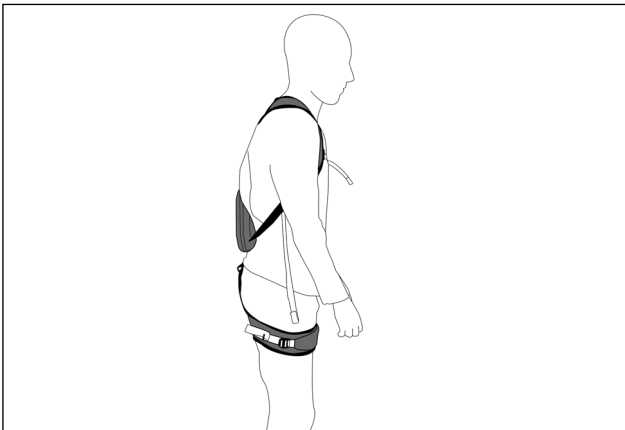


Figure 4a and 4b: Operating principle of the Hapo HD

9. Technical specifications

Table 7: Product technical data

Assistance	
Adjustment type	Straps
Range of motion	Free
Textile composition	
83.7% polyester – 12.5% polyamide – 2.3% elastane – 1.5% polyurethane	
Packaging dimensions – cm (in)	
Length	85 (33.5)
Width	45 (17.7)
Height	25 (9.8)
Product weight – g (lb)	
1100 (2.43)	
Noise emission (dB)	
5	

10. Size guide

The Hapo HD comes in a one-size design, allowing it to adapt to users with the following body types:

Table 8 : Body types covered by the Hapo HD

Name	Range covered
User height	155 – 195 cm (61 – 76.7 in)
Thigh circumference	45 – 75 cm (17.7 – 29.5 in)

However, several adjustments are available to adapt to different body types:

1. Thigh circumference adjustment.
2. Size adjustment at the shoulder straps (torso length).
3. Size adjustment at the thigh cuffs (leg length).

11. Colors

The Hapo HD is available in a single color.

Compliance and safety

12. Personnel qualification

This equipment is intended to be used by a trained person within the scope of its use.
The user may install the equipment and its accessories themselves.

13. Intended use

The Hapo HD is intended to be used by a single adult user. For optimal and safe use of the exoskeleton, the user must receive instructions from qualified personnel.

The use of the Hapo HD does not exempt the user from complying with the regulations in force in their country of use, in particular standard NF X35-109 relating to manual handling of loads. It also does not exempt the user from wearing PPE.

Operating and storage environment

It is recommended to use the exoskeleton in an open and uncluttered area in order to avoid any impacts that could damage the product and to reduce the risk of snagging.

Table 9 : Standard storage and operating environmental conditions

Storage temperature range	Operating temperature range	Not permitted
-10 °C to +50 °C – Dry environment	-10 °C to +50 °C	Explosive environment (ATEX), chemical splashes, or exposure to abrasive elements.

Product lifespan

Table 10 : Usage and wearing duration of the Hapo HD

5 years*	Maximum 8 hours/day
* This usage duration is based on the product being used in accordance with its intended purpose and maintenance instructions (cleaning, replacement of wear parts, etc.).	

The design, manufacturing, and instructions for proper use of the product have been established based on the intended service life. These guidelines include using the product in accordance with its intended purpose and maintenance instructions.

Use cases

The Hapo HD has been designed for use in most everyday situations to assist the user in movements involving hip flexion or spinal flexion:

- Partial trunk flexion (between 0° and 90°), with or without load, static or dynamic.
- Full flexion (greater than 90°), with or without load, static or dynamic.

The device has been designed to minimize potential material and human risks as much as possible, taking usage-related risks into account. However, users must keep in mind that despite all design precautions, absolute safety does not exist and residual risks remain. Only proper use and adequate user training can help limit these residual risks.

14. Precautions for use

General



- Avoid wearing the product in direct contact with the skin.
- Keep the Hapo HD away from flames, embers, or other heat sources that could damage it.
- Keep the Hapo HD away from splashes of solvents or chemical products.
- The use of the Hapo HD does not exempt the user from wearing personal protective equipment (PPE).
- Use the Hapo HD in compliance with the regulations in force in the country of use.



- Do not use the Hapo HD without ensuring that all fasteners are properly closed and that straps are correctly stored in their dedicated holders.
- Do not use the Hapo HD without having read the entire manual or without having been trained in its use by qualified personnel.
- Do not use the Hapo HD in situations involving a risk of falling (working at height, roofs, etc.) without prior approval from a safety officer.
- Do not modify the Hapo HD without written authorization from the manufacturer.
- Do not open the Hapo HD housing.
- Do not use the Hapo HD if any damage is observed on the housing, attachments, or fabric parts.
- Do not use the Hapo HD if the straps connected to the housing are frayed or cut.
- In case of medical conditions affecting the back, legs, knees, arms, or chest, consult a healthcare professional before using the Hapo HD.
- **Do not use the Hapo HD during pregnancy.**

Before use



- Check that the Hapo HD is not damaged.
- Check that the Hapo HD housing is correctly oriented.
- Check that the straps are properly adjusted and stored in their designated locations.

During use



- Use the Hapo HD in a clear and open space to avoid any risk of snagging with the working environment.
- Remove the Hapo HD if any pain occurs during its use.
- Remove the Hapo HD in case of skin irritation or itching.
- If the user wishes to sit down, loosen the activation straps.



- Do not loosen the tightening straps while using the Hapo HD.
- Do not use the Hapo HD to lift a person.

After use



- Clean the Hapo HD of any foreign matter (liquid or solid) after use.

User change



In case of transfer to another user:

- Thoroughly clean the Hapo HD before reuse.
- Inspect and prepare the Hapo HD before each user change.
- Ensure that the recipient has received training or an introduction to the use of the Hapo HD by qualified personnel.
- Adjust the Hapo HD settings to the specific needs of the new user.

In case of impact



- Do not use the Hapo HD after an impact without first carrying out a visual inspection.
- Do not use the Hapo HD if there is any doubt about the condition of a component. In case of doubt, contact the reseller.

Transport and storage



- Transport the Hapo HD in its storage pouch.
- Store the Hapo HD in a safe and suitable place.



- Do not store the Hapo HD under heavy loads.

15. Usage duration

A trial phase for the exoskeleton requires a progressive usage period until the user is fully accustomed to its use. This duration must therefore be defined on a case-by-case basis.

To date, there is no daily usage duration recommended by INRS or by standard X35-800 (published in 2023), as this criterion is left to the discretion of the user company depending on the exoskeleton model and, more importantly, on the task being performed (intensity, frequency, etc.).

16. Contraindications



- Do not use the Hapo HD in any way other than described in this manual.
- Do not use the Hapo HD during pregnancy.
- Do not use the Hapo HD if the device is damaged or broken.
- Do not use the Hapo HD for individuals with medical conditions, unless otherwise medically advised.

17. Residual risks and instructions in the event of an anomaly

Residual risks

The precautions for use and contraindications are intended to prevent the majority of hazards associated with use of the product. However, certain so-called residual risks remain unavoidable due to the technical constraints inherent in the operation of the device. The purpose of this section is to clearly inform users of these risks and of the actions to be taken in response to each of them:

- Risk of damage to or loss of function of the product in the event of a significant impact.
- Risk of damage to the product or injury to the user in the event of the failure of a component.

In the event of an anomaly

Breakage of a component or loss of Hapo HD function

1. Remove the product and stop using it.
2. Contact your agency or distributor.



Do not open the housing.

Environmental impacts

1. Check the condition of the plastic parts:
 - 1.1. Verify that there are no visible cracks on these components.
 - 1.2. If this is the case, contact your agency or distributor before any further use of the product.
2. Contact your agency or distributor in case of any doubt regarding a component.



Remove the Hapo HD in any situation that may present a risk to the product or the user.

Operating procedure

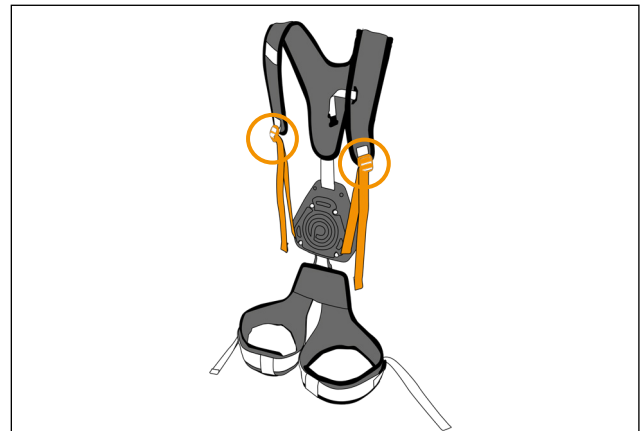
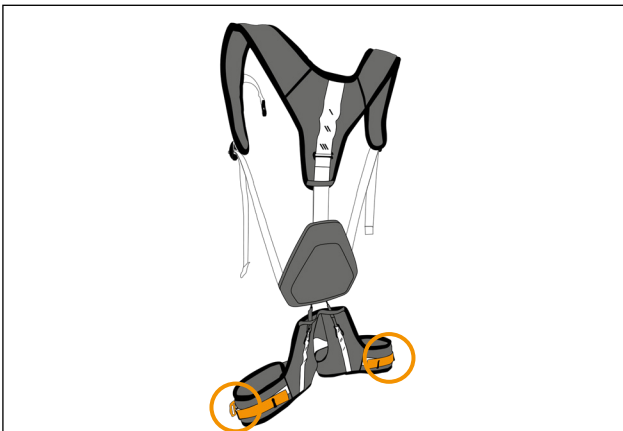
18. Unpacking

Check the visual appearance of the product. If it does not conform to its general description (see section 7 of the manual) or if any damage is detected, contact your agency or distributor.

19. Setup and adjustment of the HAPO HD

For **first-time setup**, follow the steps below:

1. **Loosen** the following straps before putting on the exoskeleton.



Figures 5a and 5b: Preparation of the exoskeleton (Step 1)

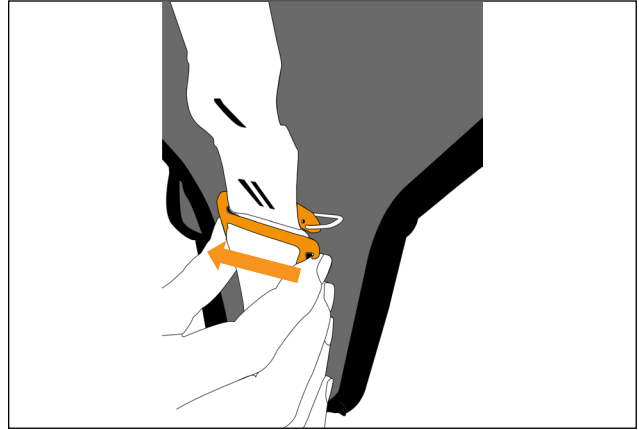
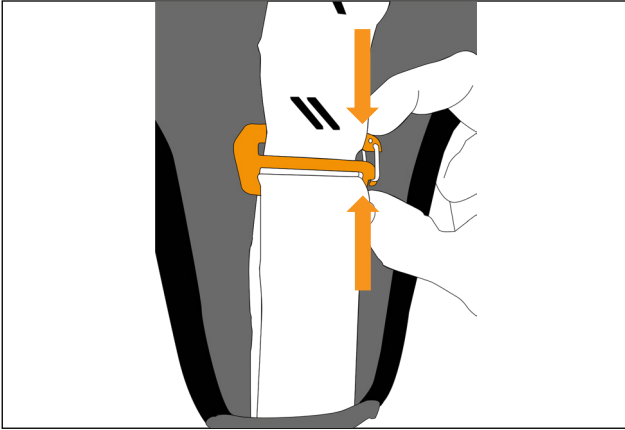
2. **Adjust** the position of the case on the shoulder straps to suit your height, using the following chart:

Table 11 : Hapo HD adjustment chart

User height – cm (in)	Shoulder strap setting	Sleeve setting
155 – 165 (61 – 65)	1	2
165 – 175 (65 – 68.9)	2	2
175 – 185 (68.9 – 72.8)	3	2
185 – 195 (68.9 – 76.8)	4	2

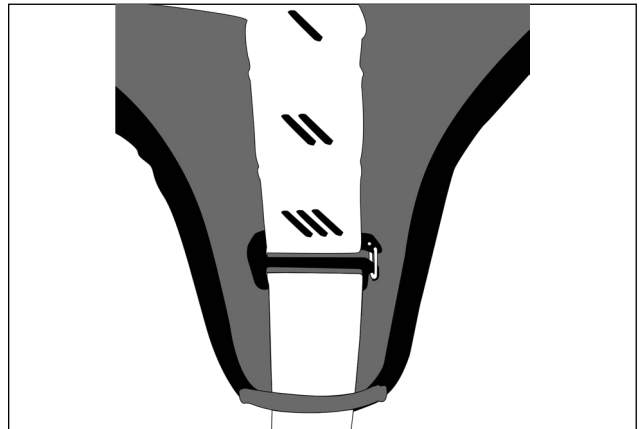
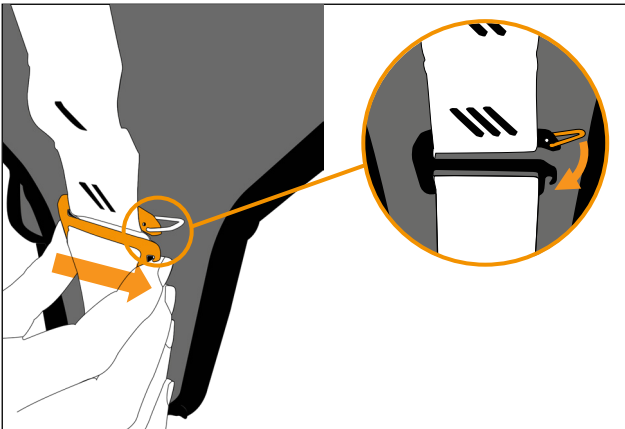
To do this:

2.1. **Remove** the adjustment buckle from the initial notch by pressing on it as shown in figures 6a and 6b.



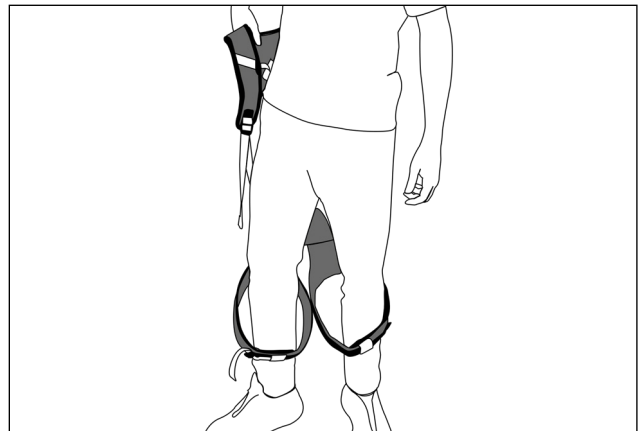
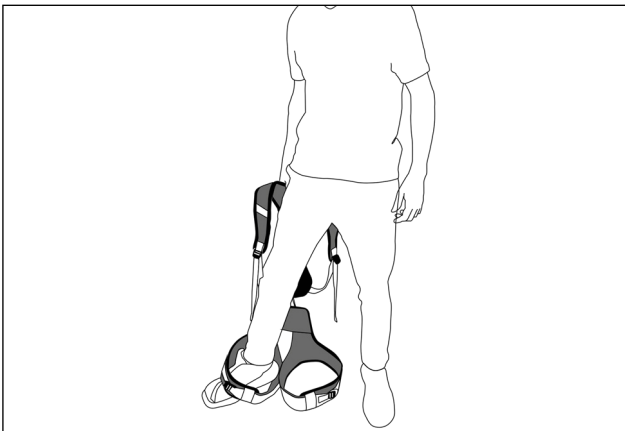
Figures 6a et 6b : Ouverture de la boucle de réglage (Step 2.1)

2.2. **Insert** the adjustment buckle into the desired notch, then close the buckle by folding down the metal spring.



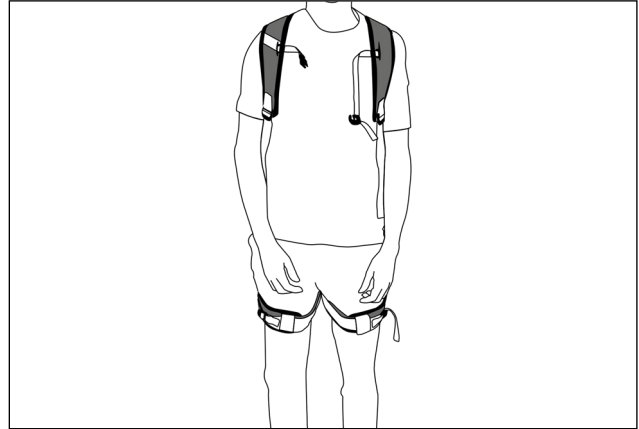
Figures 7a and 7b: Adjustment of the housing position and closing of the adjustment buckle (Step 2.2)

3. **Place** your feet into the thigh cuffs.



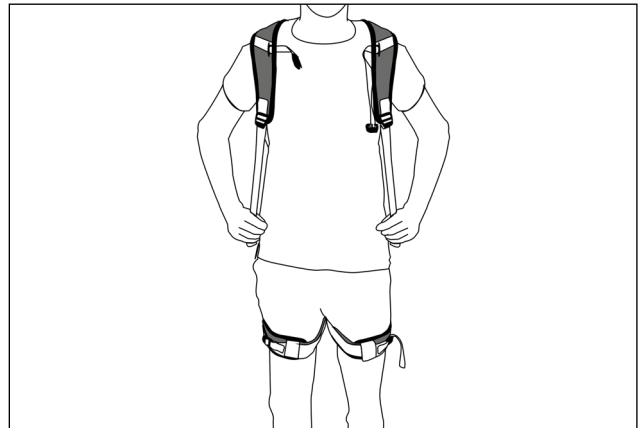
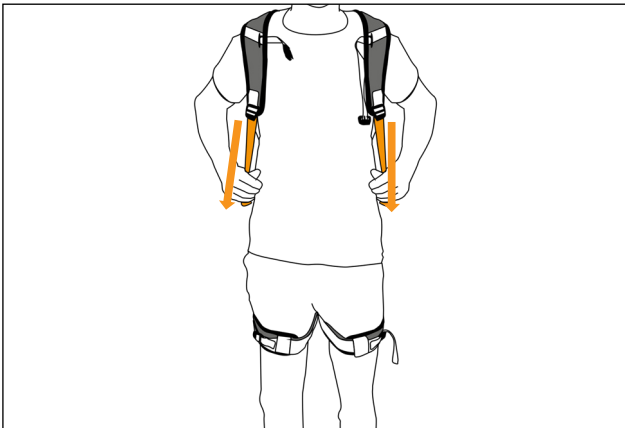
Figures 8a and 8b: Fitting the cuffs (Step 3)

4. **Put on** the shoulder straps.

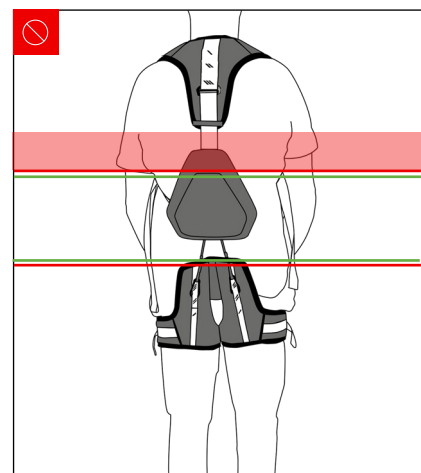
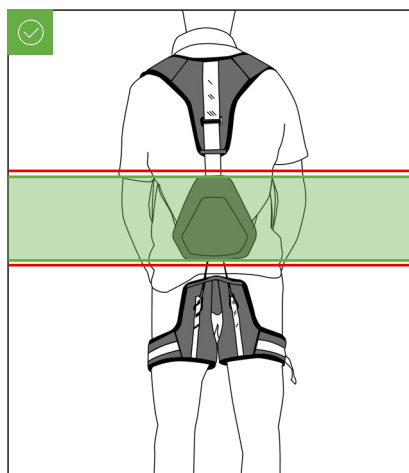
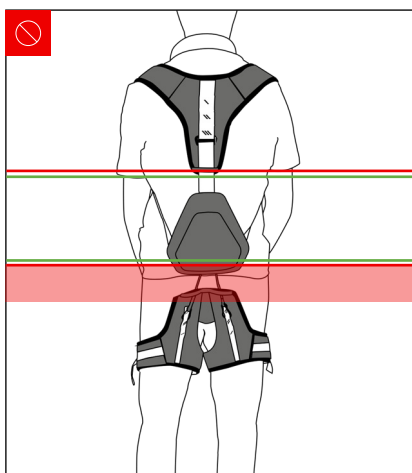


Figures 9a and 9b: Putting on the shoulder straps (Step 4)

5. **Tighten** the shoulder strap adjustment straps until the housing is positioned on the lower back (see figures 11a to 11c for the correct housing height).



Figures 11a and 11b: Tightening the shoulder straps (Step 5)

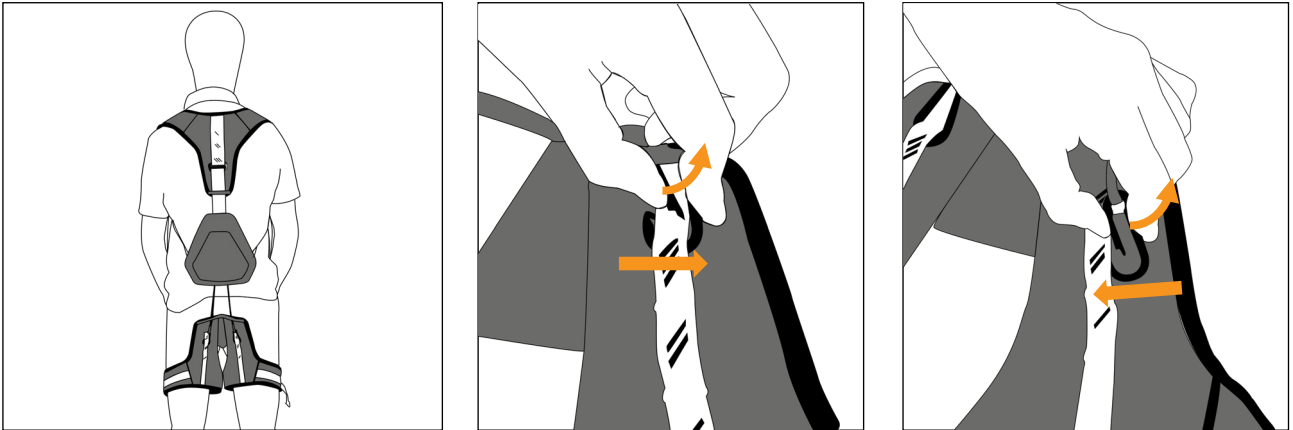


Figures 10a to 10c: Correct positioning of the housing on the back

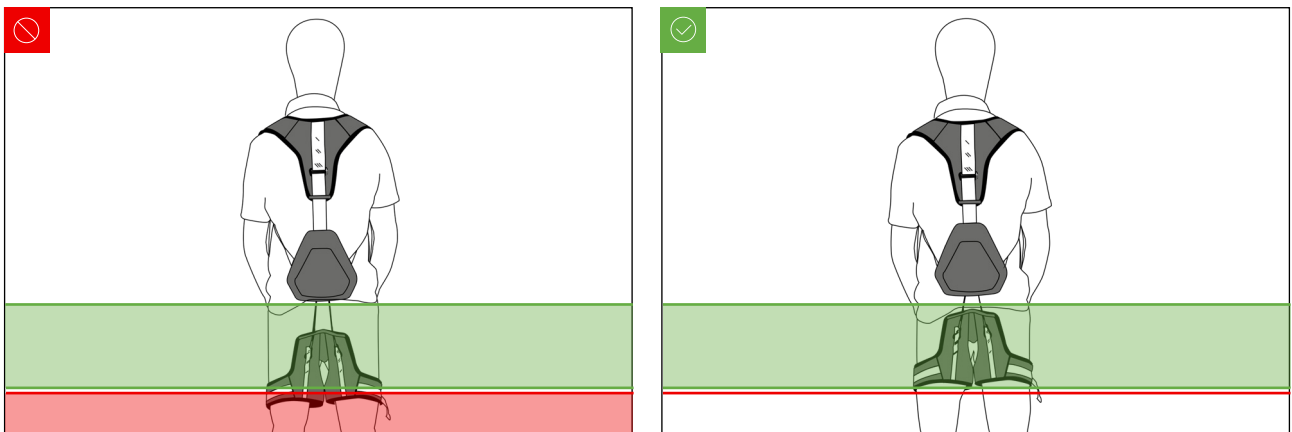


A slightly higher or lower position of the housing than recommended in figure 11b is also possible if it is more comfortable for you. However, extreme positions such as those shown in figure 11b should be avoided.

6. **Adjust** the position of the thigh cuffs as shown below. We recommend positioning them as in figure 13b, but this position may be adjusted if it causes discomfort.



Figures 13a to 13c: Adjustment of thigh cuffs height (Step 7)

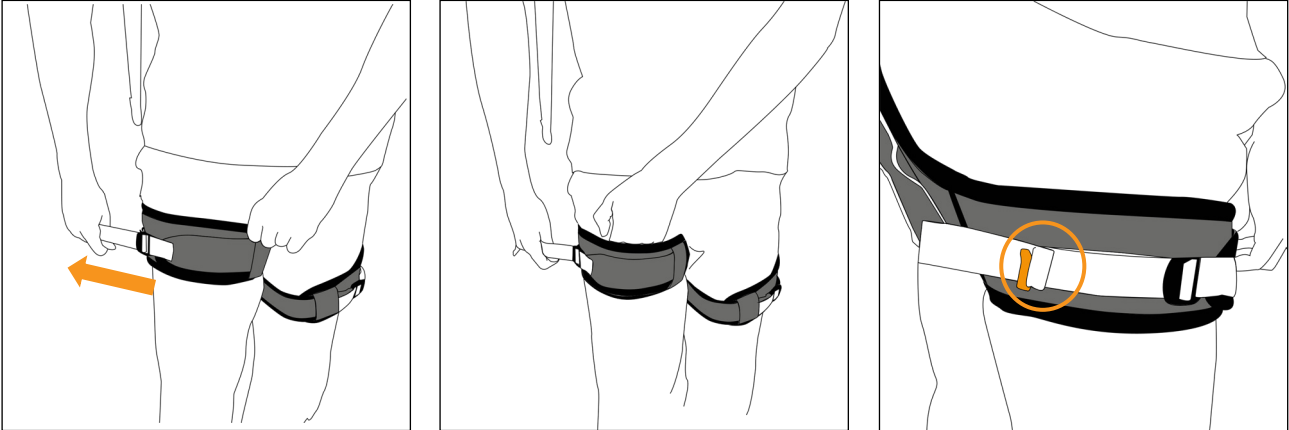


Figures 12a and 12b: Recommended positioning of the cuffs



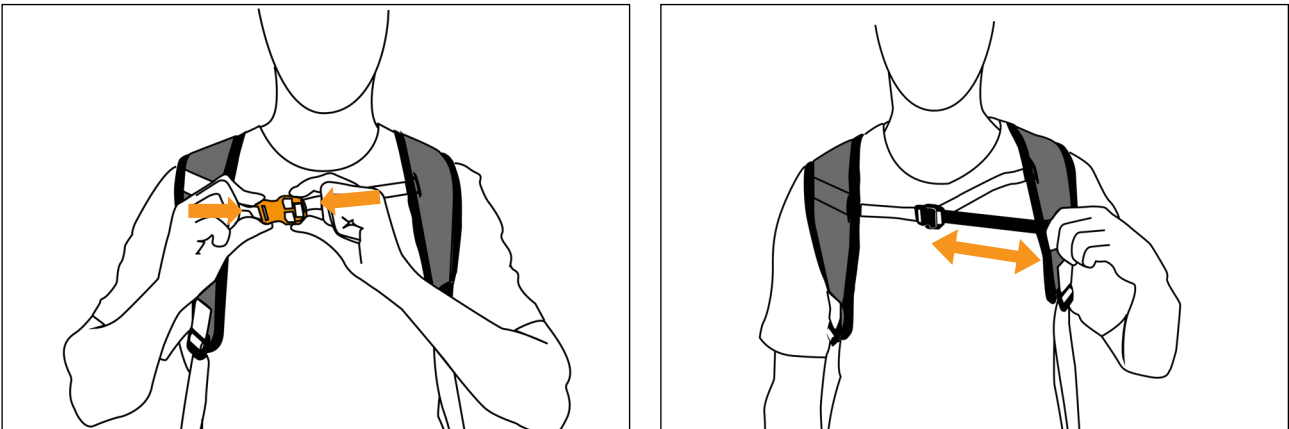
If the cord is loose, it is necessary to adjust the position of its attachment on the thigh cuffs, as shown in figures 12a to 12c.

7. **Tighten** the thigh cuff straps.
We recommend leaving a finger's width between the cuffs and your thighs for optimal tightening. Depending on body shape, the tightness may vary.
8. **Store** any excess strap length in the designated holders.



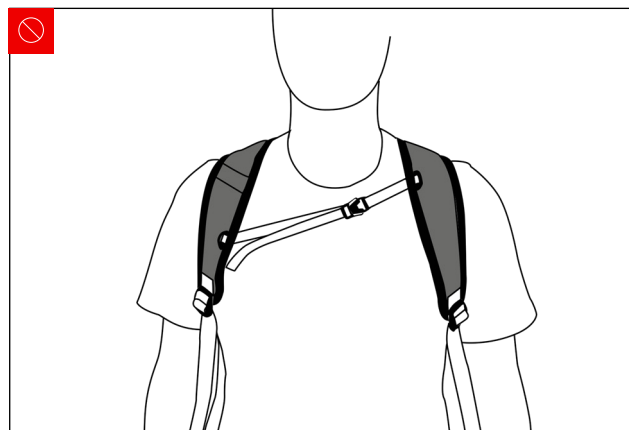
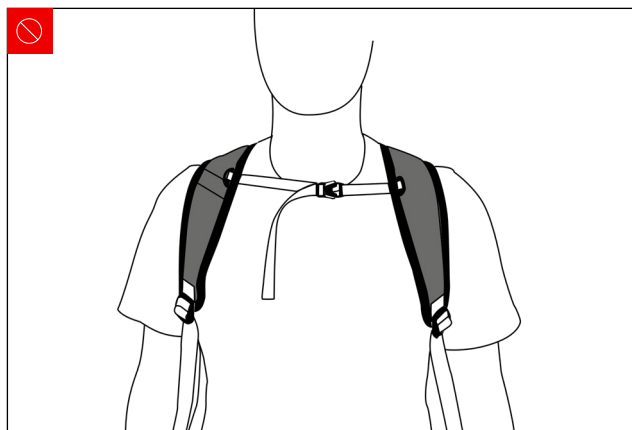
Figures 14a, 14b and 15: Tightening and storing the thigh cuff straps (Steps 7 and 8)

9. **Close** the chest strap and adjust it.



Figures 16 and 17: Closing and adjusting the chest strap (Step 9)

- ⚠ The chest strap must not cause any discomfort to the throat or tighten the chest.
- ⚠ Be careful not to have one side of the chest strap higher than the other.



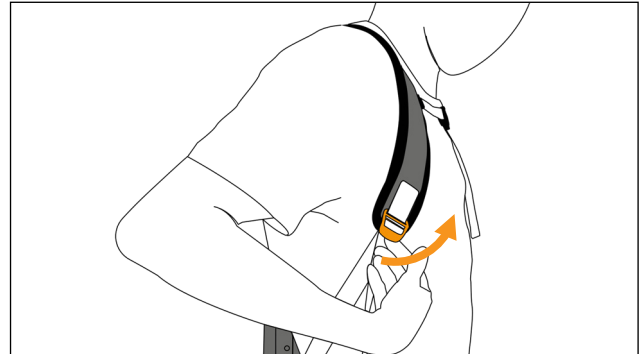
Figures 18a and 18b: Incorrect adjustment of the chest strap. Figure 19a: Chest strap too high. Figure 19b: The ends of the chest strap are not aligned.

20. Activation and deactivation of the exoskeleton

The exoskeleton can be activated or deactivated at any time.

To facilitate movement, it is recommended to deactivate the assistance during phases that do not require support, such as when going up or down stairs.

To **deactivate the** assistance, **lift** the deactivation loops.



Figures 19a and 19b: Deactivation of the assistance

To **activate** the assistance, **pull** the activation straps.

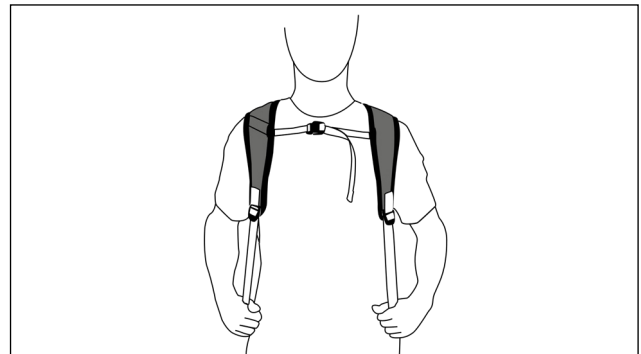
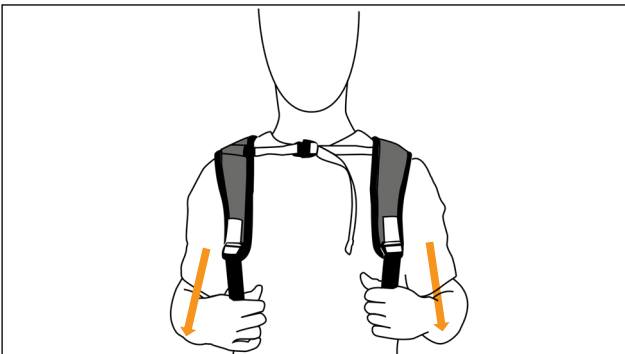


Figure 20a and 20b: Activation of the assistance

21. Removal and storage of the HAPO HD

To remove the product:

1. **Unfasten** the chest strap.

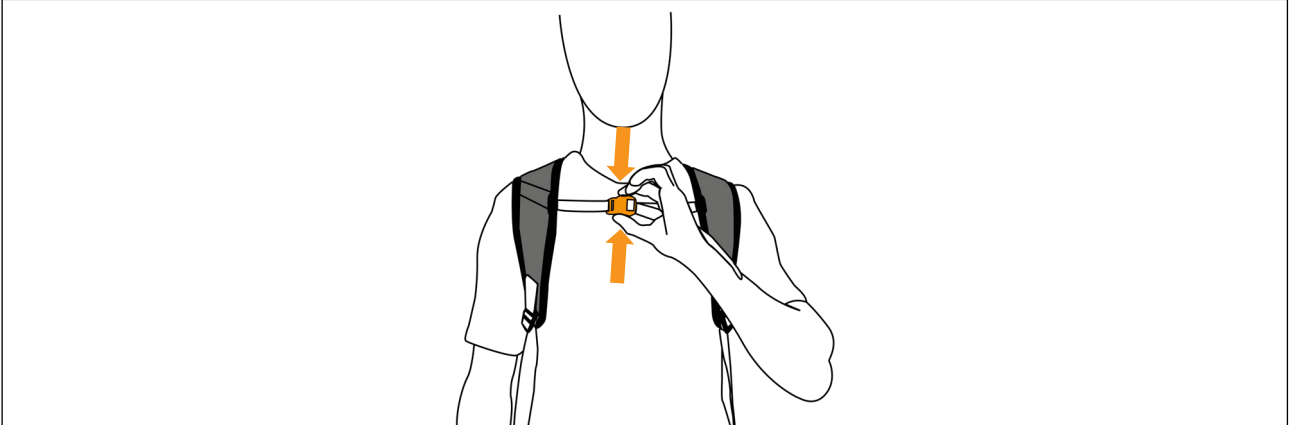


Figure 21: Removing the chest strap (Step 1)

2. **Remove** the shoulder straps, then the thigh cuffs.
If necessary, you may also loosen the shoulder straps and the cuff straps.

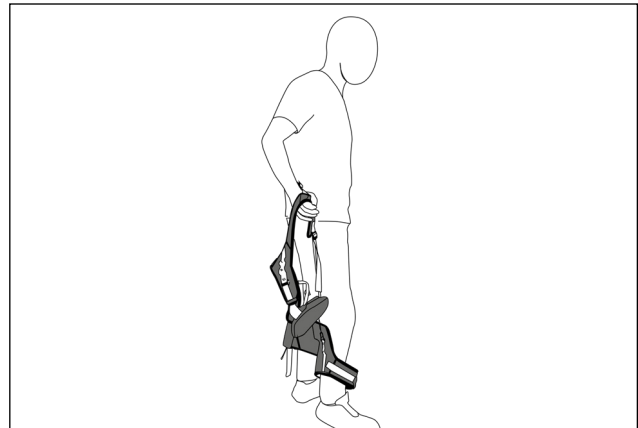
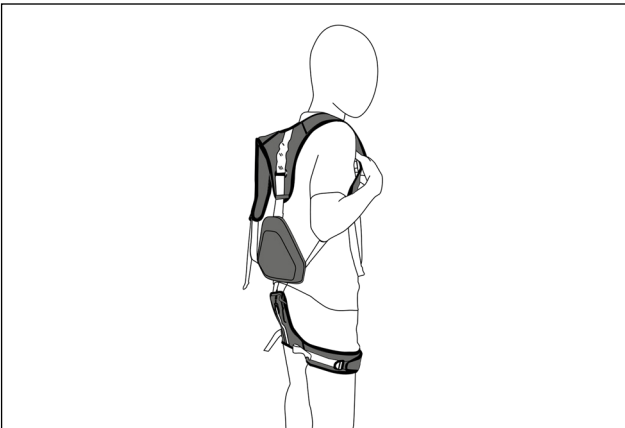


Figure 22a and 22b: Removal of the exoskeleton (Step 2)

Transport, storage and maintenance

22. Transport and storage

It is recommended to store and transport the Hapo HD on a hanger and/or in a suitable protective carrying case.

Do not store the Hapo HD in a humid place or in environments with significant temperature variations.

- ⚠ • Improper storage may damage the housing and lead to premature breakage.
- Improper storage may weaken non-fabric parts, leading to wear.

23. Cleaning and maintenance of fabric components

The fabric components of the Hapo HD can be washed by hand or in a washing machine (Table 12). It is necessary to follow the disassembly procedure described below. **Only fabric components are machine washable.** The warranty excludes any damage to the Hapo HD resulting from improper maintenance. It is recommended to use a laundry net when machine washing fabric components.

Table 12 : Cleaning and maintenance of fabric components

Machine wash permitted at 30°C , low spin (600 rpm)
Hand washing permitted
Do not use bleach
Do not iron
Solvent-based cleaning prohibited
Line drying is allowed

- ⚠ Do not use detergent powder or any products containing fabric softeners, conditioners, stain removers, or bleach. These will affect the performance of the fabrics.

24. Disassembly before cleaning the fabric components

To disassemble the fabric components before cleaning:

1. **Detach** the carabiners from the adjustment notches of the thigh cuffs.



Figure 23a to 23c: Reassembly of the shoulder straps (Step 1)

2. **Detach** the shoulder strap adjustment buckle, then pass it through the strap loop.



Figure 24a to 24c: Reassembly of the shoulder straps (Step 2)

3. **Remove** the straps from the shoulder strap buckles.

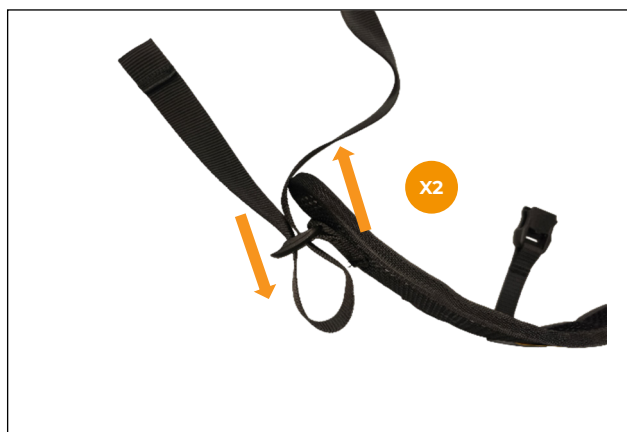


Figure 25a and 25b: Disassembly of the shoulder straps (Step 3)

4. Remove the fabric pad by unclipping the 4 snap buttons.



Figures 27a and 27b: Removal of the fabric pad (Step 4)



Figures 26: Shoulder straps and housing separated

25. Reassembly after cleaning the fabric components

To reassemble the fabric components after cleaning:

1. **Reinsert** the straps into the shoulder strap buckels.



Figures 28a to 28c: Reassembly of the shoulder straps (Step 1)

2. **Pass** the adjustment buckle through the shoulder strap loop, then attach it to the desired notch.



Figure 29 and 30: Reattaching the shoulder straps (Step 2)

3. **Pass** the carabiners through the strap loop of the cuffs, then attach them to the desired adjustment notches.



Figure 31, 32a and 32b: Reassembly of the shoulder straps (Step 3)

4. **Install** the fabric pad. To do so, clip the 4 snap buttons onto the housing.



Figure 33a et 33b: Reassembly of the fabric pad (Step 4)

26. Cleaning of other parts

Table 13 provides an indication of the chemical resistance of the plastic parts of the Hapo HD to the solvents contained in common cleaning products (A: very good resistance; B: good resistance). These solvents may be used to clean the various plastic components of the exoskeleton.



The use of solvents other than those listed in the table may damage the plastic parts instead of cleaning them. Please ensure that the components of the cleaning product you intend to use are listed in this table.

Table 13 : Approved solvents for cleaning plastic parts

Plastic parts				
		Housing	Slider / loops	Strap buckles
Materials		HDPE 300	PAHT-CF	POM
Solvents	Water + neutral pH soap	A	A	A
	Acetone	A	B	B
	Acetaldehyde	A	C	B
	Ammonium chloride	A	A	A
	Borax (boric acid)	A	A	A
	Glycerin	A	A	A
	Formaldehyde	A	C	A
	Isopropyl alcohol	A	A	A
A: Very good resistance – B: Good resistance – C: Limited resistance – N/A: no data				



If any deterioration of the part is observed during cleaning (swelling, discoloration, cracking, etc.), immediately stop the cleaning process and replace the part.

27. General maintenance



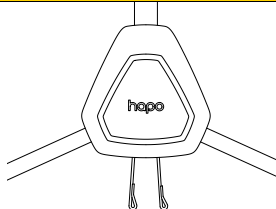
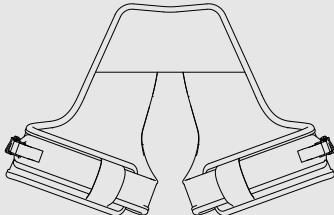
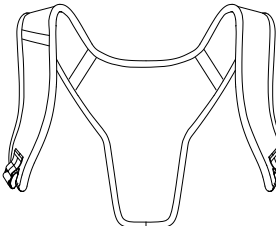
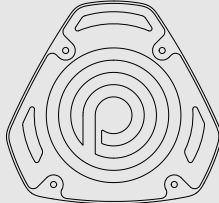
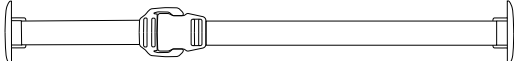
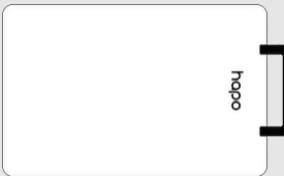
The frequency of inspections and maintenance varies depending on the actual level of use. The product may be subject to heavy use; in such cases, maintenance intervals should be reduced according to the expected level of stress.

Table 14 : General maintenance schedule

Sub-assembly	Component	Day	Week	Month	Year
Shoulder straps and cuffs	Fabric	Visual inspection: tears, excessive fraying that could affect product use	Washing according to recommendations (see Table 12 : Cleaning and maintenance of fabric components)		
	Clips / fasteners	Check visual condition. Check proper engagement of fasteners		Check proper engagement of fasteners	
Housing	Housing	Visual inspection: cracks that could affect proper product function		Check that the housing is properly closed	
	Cord	Visual inspection: tears, excessive fraying that could affect product use		Check that the carabiners have not damaged the cord	
Fabric pad	Fabric pad	Visual inspection: tears, excessive fraying that could affect product use	Washing according to recommendations (see Table 12 : Cleaning and maintenance of fabric components).		

28. Spare parts and accessories

Table 15 : Spare parts and accessories

Type	Reference	Part	Image
Housing	KITHD001	HAPO HD mechanism kit	
Fabrics	KITHD002	HAPO HD cuffs kit	
	KITHD003	HAPO HD shoulder straps kit	
	KITHD005	HAPO HD fabric pad kit	
Straps	KITHD004	HAPO HD chest strap kit	
Accessory	HDTH1	HAPO TRANSPORT CASE (SMALL MODEL)	

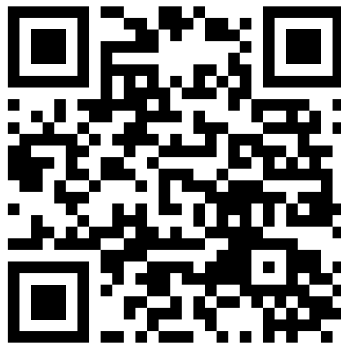
Warranty

The Hapo HD is guaranteed for 2 years from the date of the warranty declaration or, failing that, from the date of shipment of the product by the manufacturer.

After purchasing the Hapo HD, please go to the following address and complete the form:

<https://www.hapo.eu/en/content/63-warranty-statement>

You can also scan the following QR code:



Disposal

Disposal of the equipment must comply with the country's waste sorting and recycling requirements.

Legal information

The Hapo HD is CE marked in accordance with Directive 2006/42/EC for sales in Europe. Legal conditions are subject to the national legislation of the country of use.

Liability

The manufacturer is only responsible if the product is used in accordance with the descriptions and instructions provided in this manual. The manufacturer declines all responsibility for any damage resulting from failure to comply with these instructions.

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