skelex

Be your ultimate

☐	**Skelex 360-XFR**	000-0009-0A
☐	**Skelex 360-XFR Small**	000-0010-0A
☐	**Skelex 360-XFR Welding**	000-0011-0A

Instruction manual

Date of issue: 17/07/2020
EN

Important, read before using!

CE

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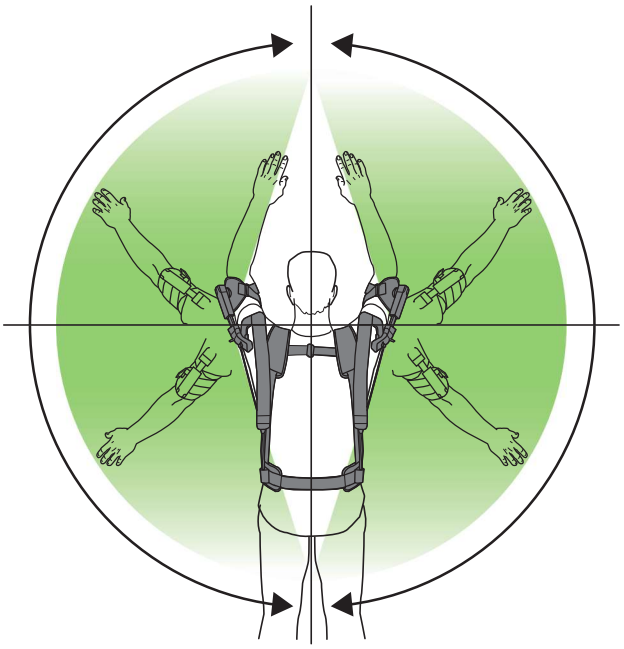
Introduction

Introduction
The Skelex 360-XFR (Small and Welding) is a non-powered exoskeleton that supports the weight of arms against gravity.

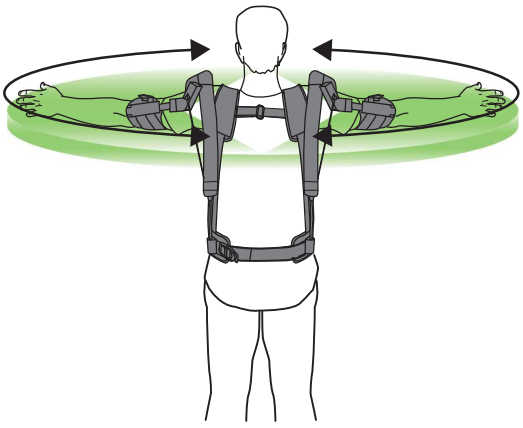
While using the device properly for the intended application, you will experience a feeling of weightlessness in your arms, relieving fatigue for tasks that require continuous elevation of the arms in the front or overhead.

The device works on the principle of gravity balancing, providing no force when the arms are relaxed and resting by your side, and gradually increasing the support as arms are lifted upwards.

You can also adjust the amount of support provided by the device individually per arm, as per your preference.



180º Vertical range of motion



180º Horizontal range of motion

Total 360º range of motion

Disclaimer

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Disclaimer

- Please read and understand all instructions carefully.
- Failure to comply with the instructions listed below may result in product failure or personal injury.
- Skelex is not liable for any injury or damage suffered by any person, either directly or indirectly, as a result of. Violation of intended usage of the product.
- Skelex does not accept any responsibility for any damage caused to its products, either directly or indirectly, as a result of use and/or repair by unauthorized personnel.

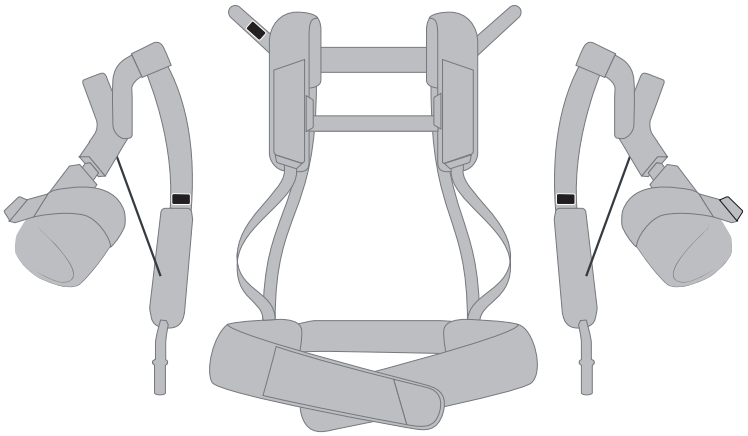
Warranty
Warranty information can be downloaded on the website.
www.skelex.com/register

skelex

Please register your
Skelex 360-XFR on:

skelex.com/register

Enter the serial number
to activate your warranty



Serial number

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For Global Skelex Dealers Network: www. skelex.com/dealers

Safety instructions

Use

Gradually increase the use over time.

- First day: maximum of 2 hours a day.
- Second day: maximum of 4 hours a day.
- Third day: 6 to 8 hours a day.

Always listen to your body and pause the use of the product if you feel any discomfort. Restart the use after a break or start again the next working day. If discomfort continues, please contact your dealer.

Misuse

- Do not stand on (parts of) the product.
- Do not place any heavy objects on the product.
- Sitting against a backrest or laying on the floor with the product is possible, but not recommended.
- The product is NOT a lifting device, do not try to lift heavy objects while wearing the product.
- Use of unauthorized replacement parts may cause accidents or injury.
- Accidents might be caused by poor maintenance.

Personal safety

- Read this manual carefully, and follow the instructions.
- Only use the product for its intended purpose.
- Wrong setup and improper wearing can lead to discomfort, irritation, and even injuries.
- Wear appropriate clothing according to industry standards.
- Keep hair and clothing away from moving parts.
- Make sure there are no hard objects in your pockets that could become pinned under neath the device.
- Never place your hands or fingers near or in between moving parts.

Warning: Pinch point hazard
Indicated by icon on FlexFrame

Safety instructions

Use caution when performing the following activities:

- Running.
- Climbing.
- Driving any vehicle.

Work Area/environment

- Keep your working environment clean, organized, and well lit, compliant to industry standards and safety regulations.
- Be careful while using the product in constrained spaces, to reduce risk of entanglement or damage.
- Do NOT operate the product in explosive environments or near inflammable substances, liquids, or gasses.
- Working temperature: -20 °C to 40 °C.
- The product is designed for indoor as well for outdoor use. See the chapter Technical Specification for standards about visibility and water and oil repellent.

Calamities

- In case of calamities, remove the product immediately and look for a safe exit.
- Before CPR, disengage and remove the device.

Discontinue or pause using the Skelex and contact your supplier:

- When experiencing physical complaints or negative side effects.
- When wearing the product becomes less comfortable.
- When a part is dysfunctional or broken.
- If you notice visible damage to the product.

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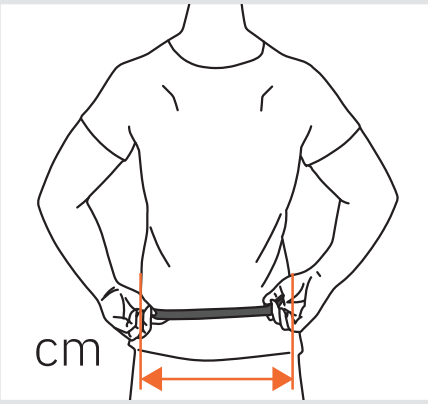
Operating instructions: sizing | settings

Before putting the exoskeleton on (donning), it is very important to set it to your personal body size. Correct sizing and settings will improve the fit, function, and range of motion. Right settings will ensure right arm support while working.

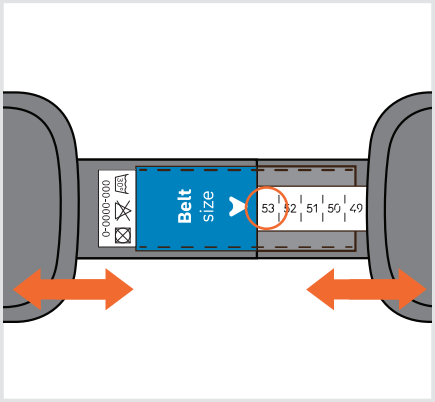
Please, follow the 5 BLUE steps for the correct settings:

Step 1: belt settings
Step 2: height settings
Step 3: arm length settings
Step 4: force setting
Step 5: arm cup selection

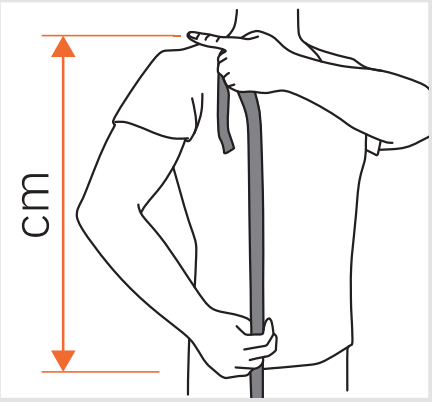


Step 1: belt settings

- At the location of the belt, measure around your waist circumference from your left side to right side in centimeters.



- Adjust the size of the belt.
- Your measure/sizing is visible next to the indicator in the center.
- Secure belt with buckle.

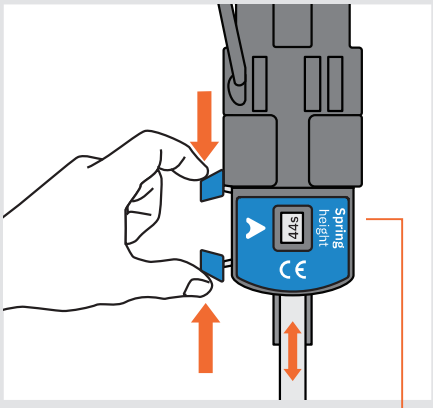


Step 2: frame height settings

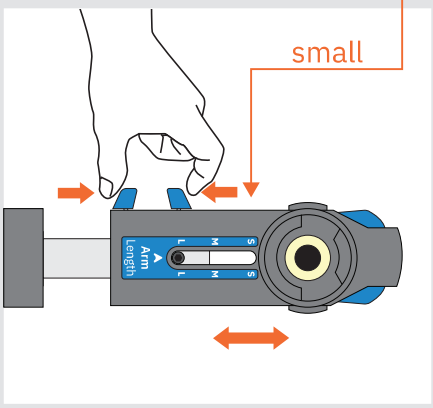
- Measure the vertical distance from the hip bone to the top of your shoulder.
- Take the measurement in centimeters.
- Only measure in a straight line, do not curve over your shoulder.

For more information and instruction videos: www.skelex.com/downloads

Operating instructions: sizing | settings



- Adjust the height of the Frames.
- Hold the lower frame in one hand and pinch the adjustment knobs with the other hand.
- Adjust the height of the spring so your body measurement is visible in the window.
  Range adjustment: 44cm to 55cm.
- Release the pinch on the adjustment knobs.
- Notice the letter near the spring height setting (S, M, or L).
- Use this letter for the arm length setting in step 3.



Step 3: arm length settings

- Use the S, M, or L indicator from the previous step to set the arm length correctly.
- Push the blue pinch knobs towards each other to release the mechanism.
- Slide the arm interface till the corresponding length (S, M, or L) is visible in the window.
- Release the adjustment knobs and repeat for the other arms.

Body weight kg	Adjustment setting
50	1
65	2
80	3
95	4

Table force settings:
Skelex 360-XFR & Skelex 360-XFR Welding

Step 4: support force settings

- Adjust the supporting force according to your body weight. The force setting is related to your total body weight.
- Use table table left, for the right force setting for *the Skelex 360-XFR and the Skelex 360-XFR Welding.*
- The amount of support can be adjusted depending on the tools used, type of activity, and subjective preference. e.g. increase force when using heavy tools.
- How to adjust the force setting, see next page.

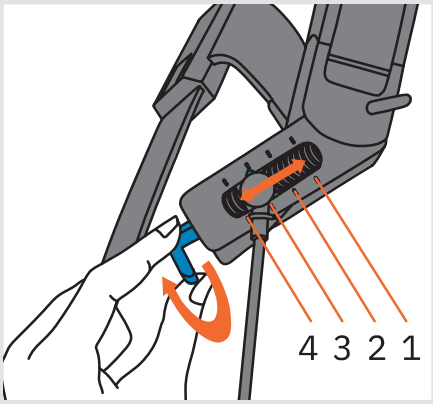
Body weight kg	Adjustment setting
40	1
50	2
65	3
80	4

Table force settings:
Skelex 360-XFR Small

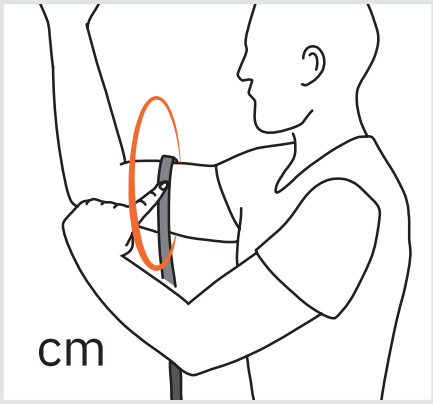
- Use table table left, for the right force setting for the *Skelex 360-XFR Small.*
- The amount of support can be adjusted depending on the tools used, type of activity, and subjective preference. e.g. increase force when using heavy tools.
- How to adjust the force setting, see next page.

For more information and instruction videos: www.skelex.com/downloads

Operating instructions: sizing | settings



- To adjusting the arm support force, open the blue lever.
- Rotate the lever until the force indicator is at the desired position.
- Place the blue lever back in the housing.
- Repeat for the other arm.

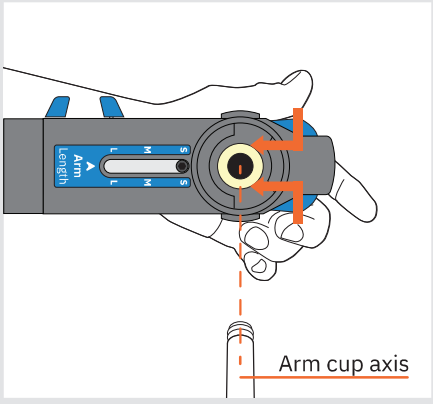


Step 5: arm cup selection

- The product comes standard with MEDIUM arm cups; different sizes of arm cups are available.
- To determine the right arm cup sizing measure the circumference of your upper arm.
- Keep your upper arm horizontal and take the measurement halfway your upper arm or on the largest part of your biceps muscle.

	Min (cm)	Max (cm)
Small	20	28
Medium	27	35
Large	34	42

- Use the table on the left, to select the right arm cup.
- If there are two possibilities, use the larger size arm cup.
- If your measurement is not in the table, use the arm cup that is closest to your arm measurement.



- To remove the arm cup, press in both blue buttons and push them in towards the arm cup axis.
- Select the correct arm cup.
- Insert the arm cup by pressing in both blue buttons and slide them again horizontally in towards the arm cup axis.
- Check the lock by trying to pull the arm cup from the arm to make sure the arm cup is properly locked in place and can still rotate.

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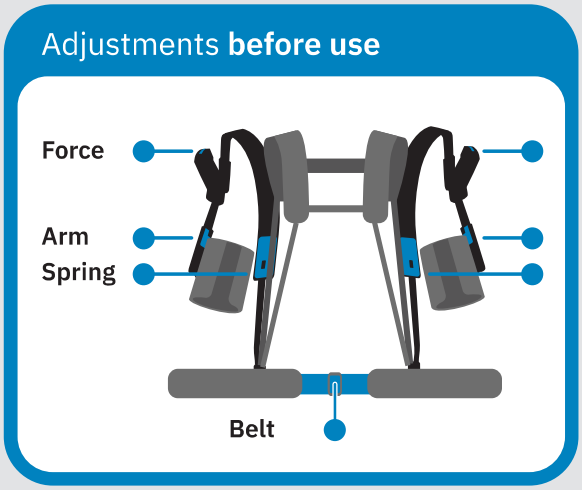
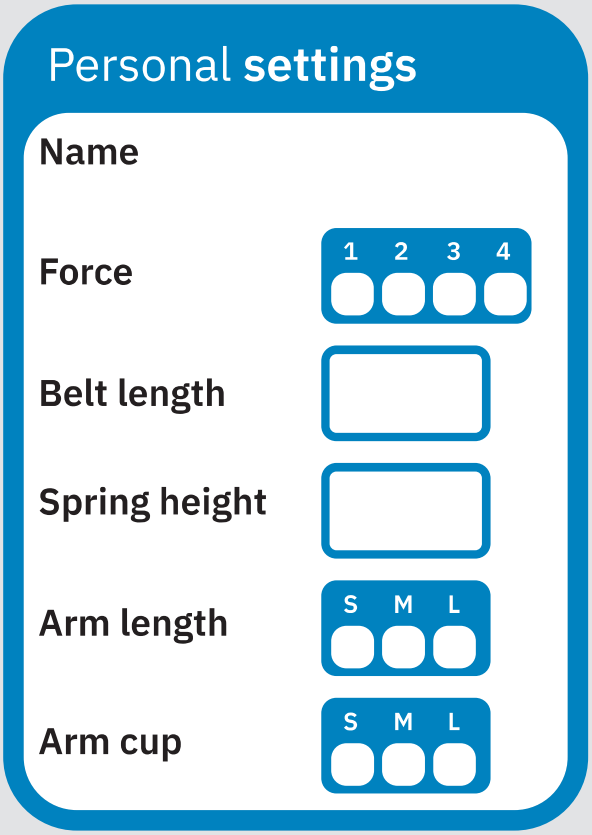
Operating instructions: sizing | settings

- To tighten or loosen the arm strap, adjust buckle of arm cup straps.
- Make sure the strap does not pinch the upper arm.



Infographics pictured inside the belt



Fill in your personal settings in this overview

For more information and instruction videos: www.skelex.com/downloads

Operating instructions: donning | putting on

Make sure you went through all the blue steps for the right settings. Make sure the belt, frames, and arms are correctly sized to your body dimensions.

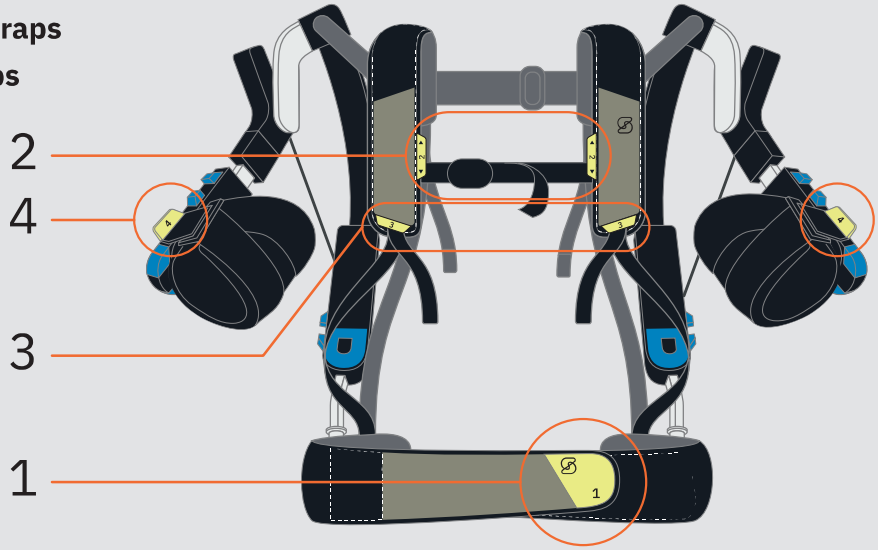
Follow the 4 YELLOW steps in the correct order to engage the exoskeleton:

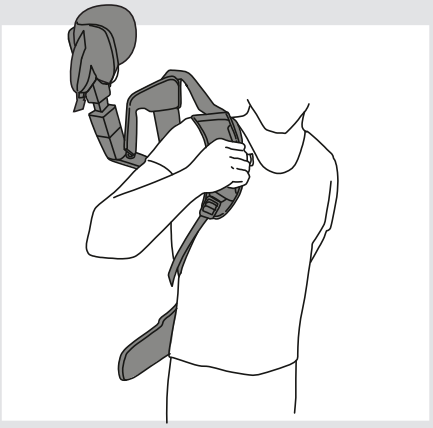
Step 1: strap the belt

Step 2: engage and lock the chest strap

Step 3: pull the shoulder straps

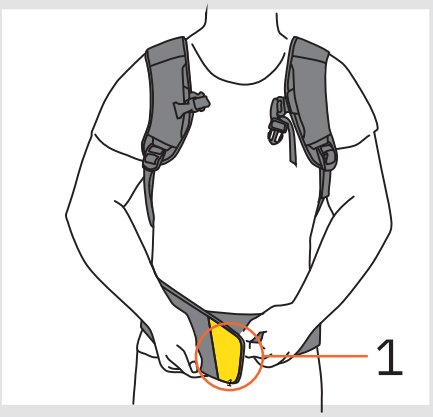
Step 4: engage the arm cups





Before putting the Skelex on:

- Open the velcro of the belt.
- Open the chest strap buckle.
- Loosen the shoulder straps.
- Open the arm cup straps.
- Put the exoskeleton on like a backpack by holding it at the shoulder straps.
- Put it loosely on your shoulders.



Step 1: strap the belt

- Secure the belt with some tension with the elastic parts on the pelvic bones.
- Make sure the belt is symmetrically on your left and right hip.

For more information and instruction videos: www.skelex.com/downloads

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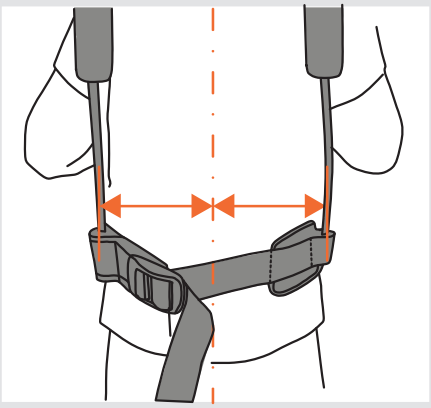
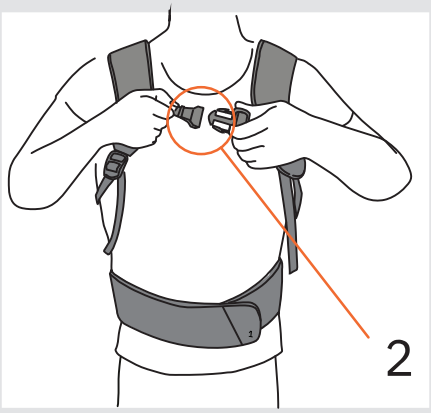
Operating instructions: donning | putting on

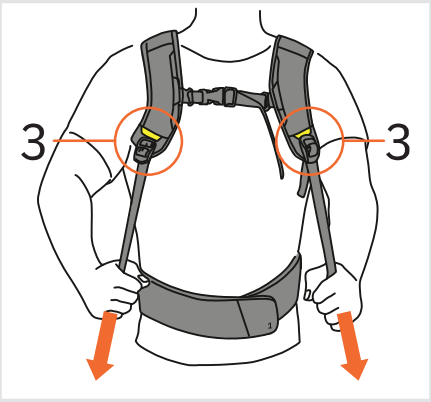


- Make sure the product is put on symmetrical on your back.



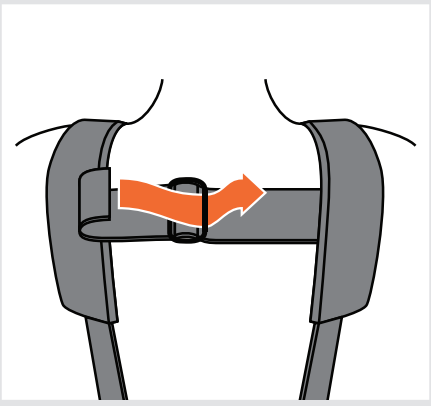
Step 2: engage and lock the chest strap

- Secure the chest strap at a comfortable height.
- Tighten the strap so the shoulder straps are away from the armpit.

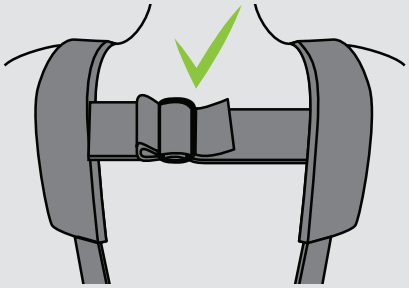


Step 3: pull the shoulder straps

- Tighten shoulder straps for a comfortable fit.



- It is important to secure the shoulder strap.
- Re-route the end of shoulder strap webbing through the buckle.



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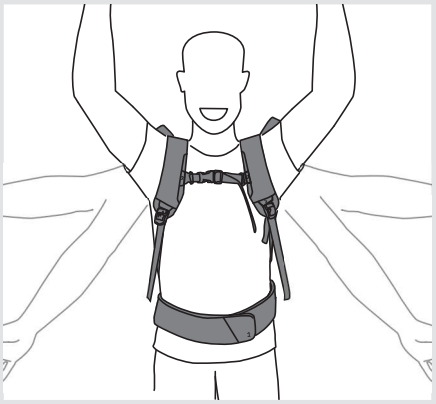
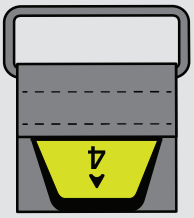
Operating instructions: donning | putting on



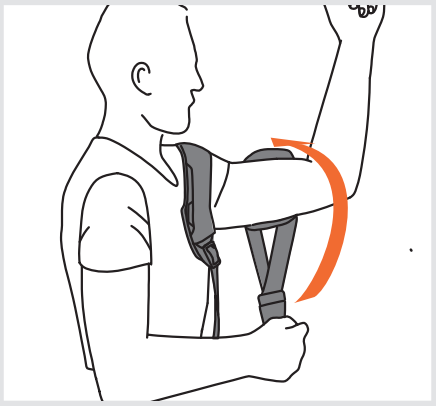
- Ensure your clothing is not constraining movement of arms.
- Check the range of motion by moving your arms vertically up and horizontally.
- If necessary, loosen restricting clothing or adjust / loosen the straps.

Step 4: engage the arm cups

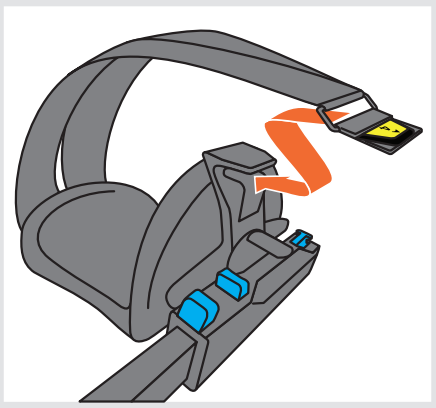
- To engage the arm support, pull the GripLabel at the end of the arm cup strap down.



GripLabel



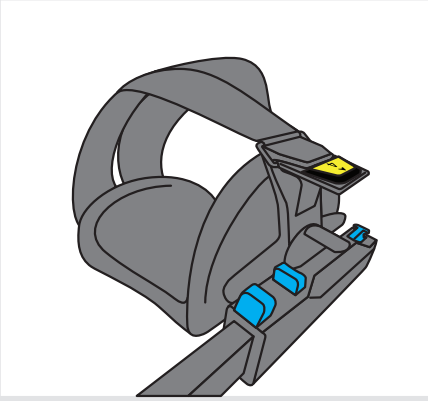
- Place your upper arm on the arm cup.
- Wrap the strap around your upper arm.
- Lock the grip label on the hook.



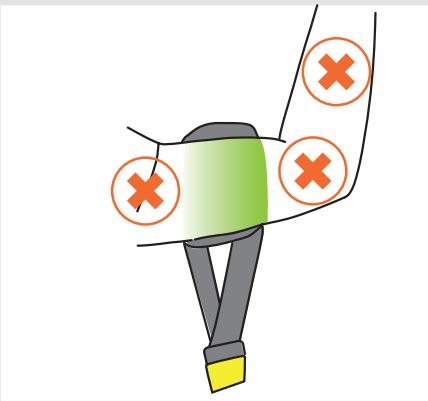
- Lock GripLabel in the hook of the arm cup.

For more information and instruction videos: www.skelex.com/downloads

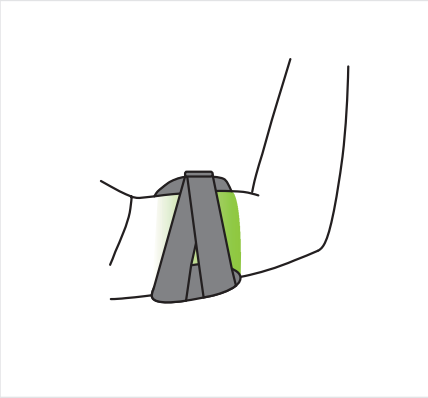
Operating instructions: donning | putting on



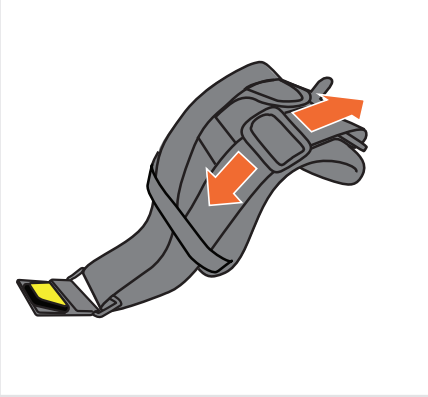
- Make sure the GripLabel is securely locked in place.
- Make sure there is enough tension in the arm straps to avoid unlocking the GripLabel.
- Avoid too much tension in the straps, to prevent pinching of the upper arm by the arm straps.



- These are examples of where you should NOT place the arm cup.



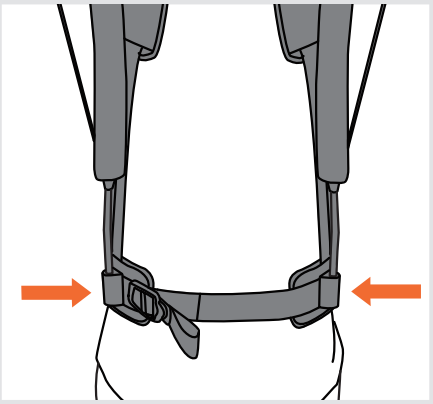
- Make sure that the arm cup strap is evenly spread on the upper arm and create a “V” shape.



- To tighten or loosen the arm strap, adjust buckle of arm cup straps.
- Make sure the strap does not pinch the upper arm.

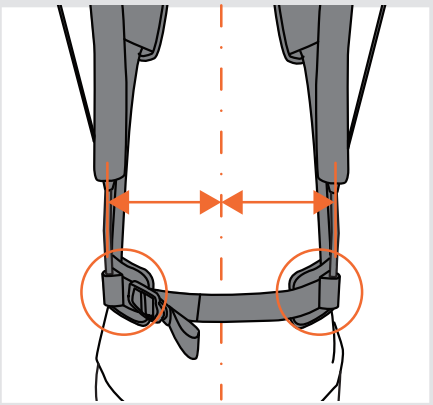
For more information and instruction videos: www.skelex.com/downloads

Operating instructions: checking the fit

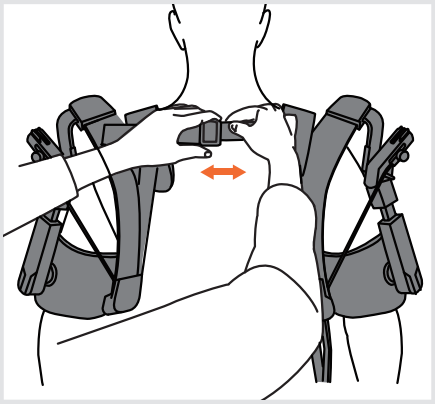


Belt

- Check belt position and belt orientation.
- The belt must be tight enough, so it is not sliding down when the arms are lifted.
- If the belt is sliding, open the belt, reposition it and tighten it more.
- Make sure the belt is on your pelvic bones.

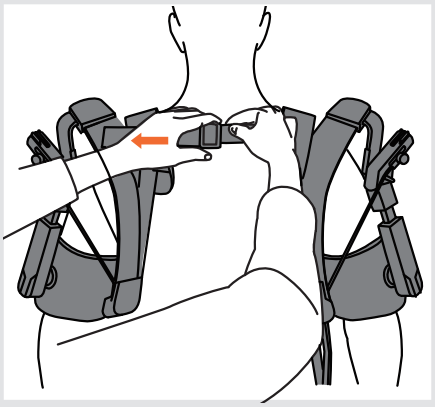


- The belt hinges must be symmetrical on your waist and slightly to the rear.
- You should never touch the belt hinges.



Frame and harness

- Widen the shoulder strap, if you experience pressure or discomfort on the shoulders due to contact.

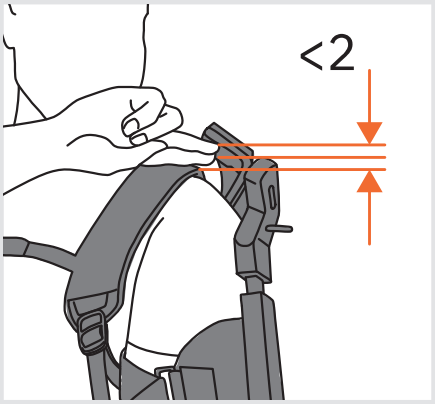


- If the Skelex shoulders are away from your shoulders, tighten the shoulder strap at the back.
- Shoulder straps can also be tightened to help to improve fit .

For more information and instruction videos: www.skelex.com/downloads

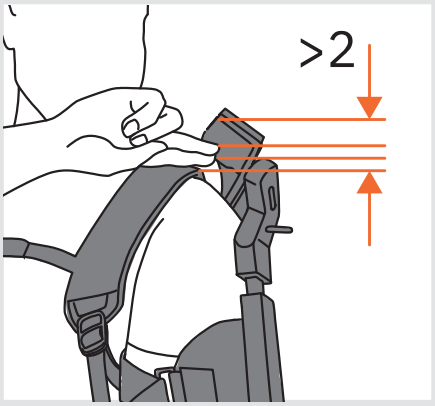
Operating instructions: checking the fit

skelex



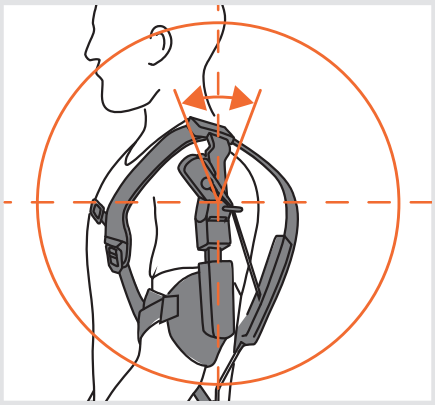
When the arms are down, the distance between the spring and your shoulder must be 2 fingers thick.
If there is less space between the shoulder and the spring:

- Increase the height of the springs.
- Tighten the shoulder straps if they are loose.
- Reposition the belt at a higher position.

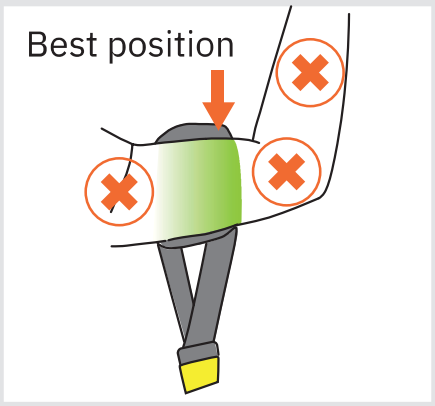


If there is more than 2 finger thicknesses space above the shoulder:

- Decrease the height of the springs.
- Loosen the shoulder straps a little if these are tight.
- Reposition the belt at a lower position.



- The hinge should be above and centered with your shoulder center.
- When the hinge is in front of your shoulder, tighten shoulder connector strap or increase the length of the arms.
- When the hinge is behind your shoulder, loosen the shoulder connector strap or shorten the length of the arms.



Arm cups

- The arm cup should be on the furthest half on the upper arm.
- The arm cup should not touch the sensitive bones near the elbow. If occurring irritation around the elbow area or elbow crease, reposition the arm cup by shortening the arm length.
- If the arm cup is not to far from the elbow, it could feel as if the shoulder is pushed up. Remove and reposition the arm cup towards the elbow or increase the length of the arm.

For more information and instruction videos: www.skelex.com/downloads

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Operating instructions: troubleshooting

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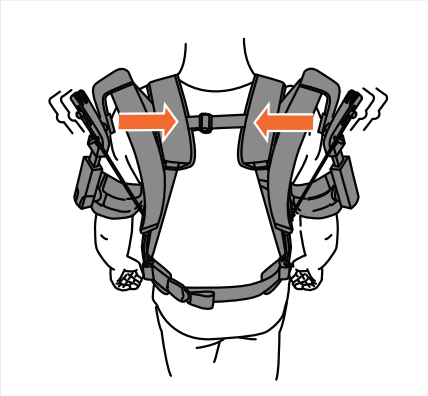
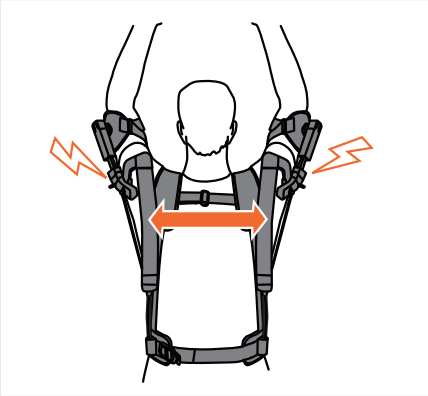


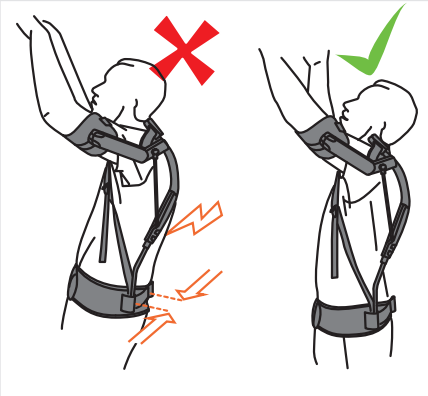
The frames feel loose during use

- If the FlexFrames feel loose during movement, tighten the back strap.



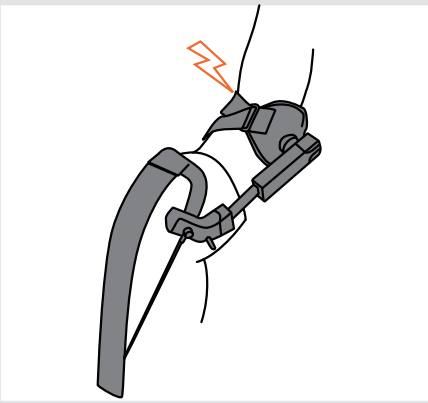
The frames rub the side of the shoulders

- Increase the length of the back strap.



Frames are touching the back when the arms are lifted

- Set the belt in a smaller size.
- Ensure working in an ergonomic posture with your back straight.

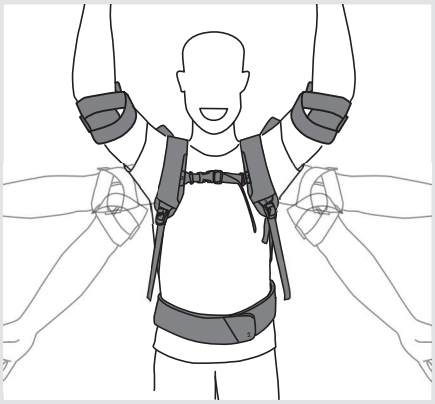


Irritation of the arm cup

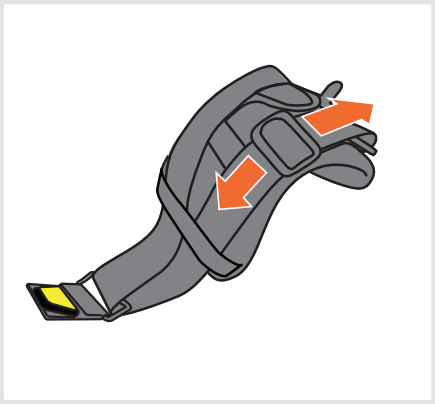
- Minimal sliding of the arm cups is normal during use, but if it causes irritation due to excessive slid ing, check if the product is adjusted correctly.
- Move the arm cup higher on your upper arm, away from your elbow.
- Tighten the arm cup strap.
- Shorten the length of the arm.
- Choose a smaller arm cup size.
- Decrease force arm support.

For more information and instruction videos: www.skelex.com/downloads

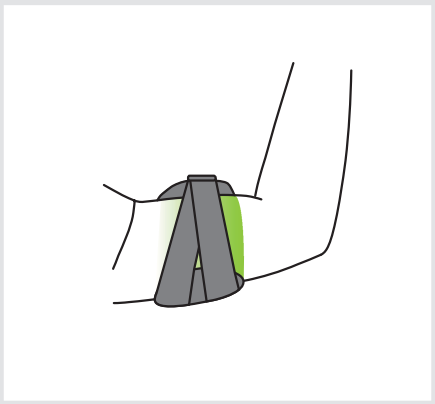
Operating instructions: troubleshooting



- Check for constrained clothing.
- Move your arms vertically up.
- Move your arms horizontal.
- Check the range of your arm motion.
- If necessary, loosen restricting clothing.



- To tighten or loosen the arm strap, adjust buckle of arm cup straps.
- Make sure the strap does not pinch the upper arm.



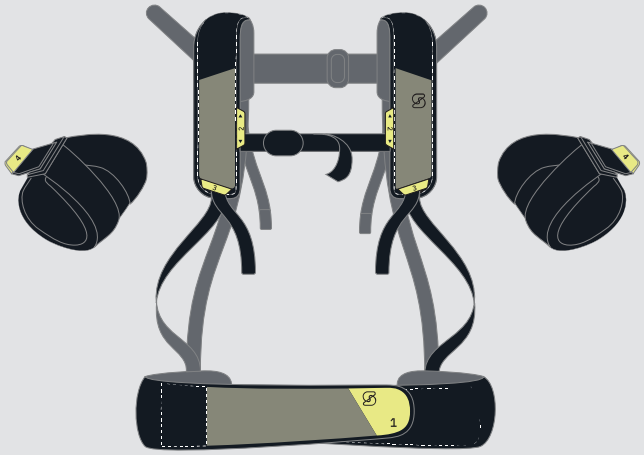
- Make sure that the arm cup strap is evenly spread on the upper arm and create a “V” shape.

For more information and instruction videos: www.skelex.com/downloads

Maintenance instructions: cleaning

Skelex advises using a personal Softgoods set per user to maintain proper personal hygeine. A personal Softgoods set consists of a harness and a set of arm cups.
Wash Softgoods regularly and clean the FlexFrames before every shift to prevent interpersonal contamination.

Follow the hygiene instructions below:



Personal softgoods set
1x Harness and 1x set of Arm cups

Cleaning and disinfecting FlexFrames

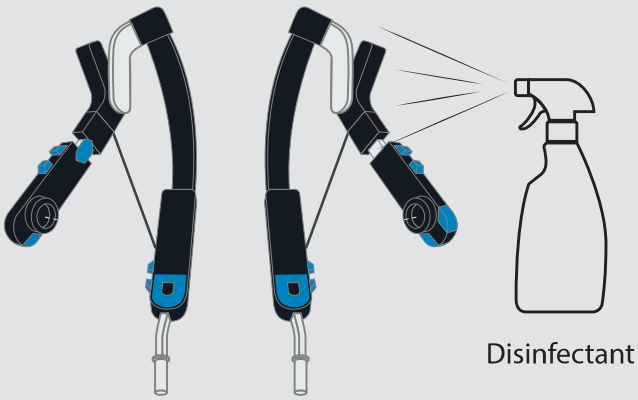
Step 1: **dis-assemble both FlexFrames from the harness.**

Step 2: **dis-assemble both arm cups.**

Step 3: **spray FlexFrames with a disinfectant.**

Step 4: **wipe FlexFrames with a dry cloth.**

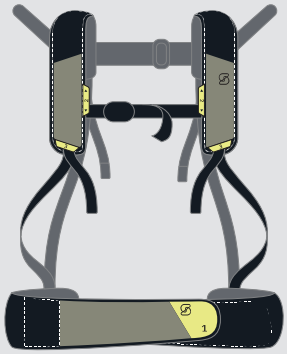
Step 5: **assemble the FlexFrames with the harness and continue use.**



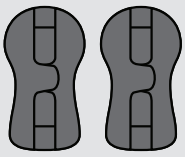
Disinfectant

Set of FlexFrames

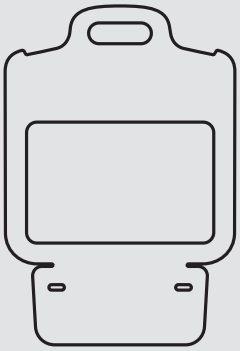
Maintenance instructions: washing



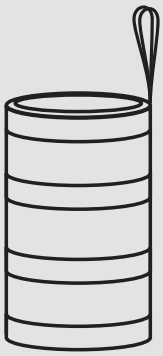
Harness



Set of
Arm cup socks



Hanger



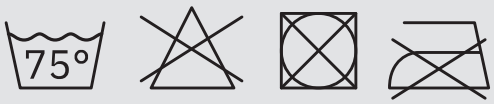
Washing bag

Washing instructions: Softgoods

- Arm cup socks, arm cup straps and Arm cup padding can be removed for washing.
- Harness and textile components can be washed in a regular washing machine after inserting in a (Skelex) laundry bag.
- For best results use an industrial washing service for safety clothing.
- Dry harness in a dry surrounding out of sunlight.
- Dry harness on (cloth) hanger.

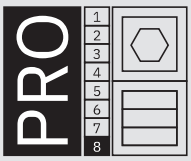
Domestic washing

- Machine wash max 75 degrees centigrade.
- No chlorine, or bleach.
- Do not tumble dry.
- Do not iron.



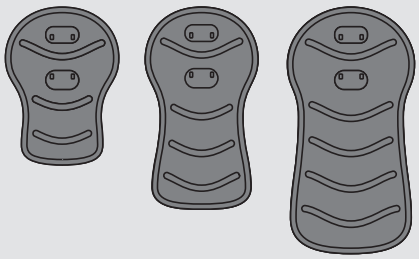
Industrial washing

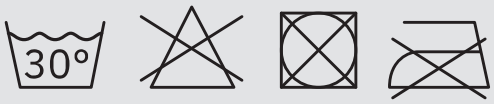
75°
Colour:



Washing instructions: EVA padding

- EVA pads are interchangeable and washable.
- Machine wash max 30 degrees centigrade.
- No chlorine, or bleach.
- Do not tumble dry.
- Do not iron.
- Dry padding out of sunlight.





Maintenance instructions

Daily, pre-use checks
- Cable protection lining and cable caps are not damaged.
- Carbon fiber springs have no visible cracks or damage.
- The main hinges move freely and smoothly.
- The belt hinge and the harness connectors are properly secured.
- The harness, including all the straps are not damaged.
- The arm cup is attached securely, elastics and GripLabel are not damaged.

Weekly checks
- Harness and all straps are cleaned and can be adjusted smoothly.
- No squeaking noise on moving the arms.
- Force and size adjustments are working smoothly.
- Belt hinge and harness connection can be unlocked and relocked.

Storage
- Release tension in the arms during storage by placing them in the most upward position.
- Store in a clean, dust-free, and dry environment.
- Do not store in direct sunlight.

When the product is not being used:
- Take care of the arms that might stick out.
- Hang it on a coat hanger.
- Place it in a clothes locker.
- Place it in the shipping box.
- Place it on a clean flat surface.
- For compactness, the product can be set at the smallest setting.

Transport
- Transport the product in provided box or similar rigid box.
- Wrap the product in bubble wrap or other safety, impact material.
- Always transport the product dry and clean.
- Unload the arm supports by placing them in the most upward position.
- Minimize force arm supports.
- Make sure the frames do not stick out of the packaging.
- For compactness, the product can be set at the smallest setting.

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Maintenance instructions: service and repair

Service

- For questions regarding customer service and repair, please contact your dealer or visit: www.skelex.com.
- Serial number is required for repair or serve. The Location of serial numbers is shown in chapter A2.
- Service and repairs must be performed by authorized repair personnel only.
- When servicing the product, use only identical, authorized, replacement parts.
- The product does not need lubrication.

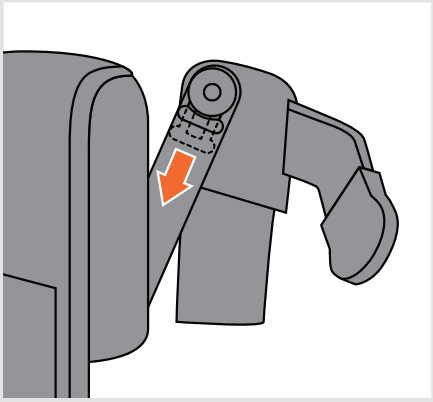
Replacement parts

- Please contact your dealer, for the availability of authorized replacement parts.

Recycling and disposal

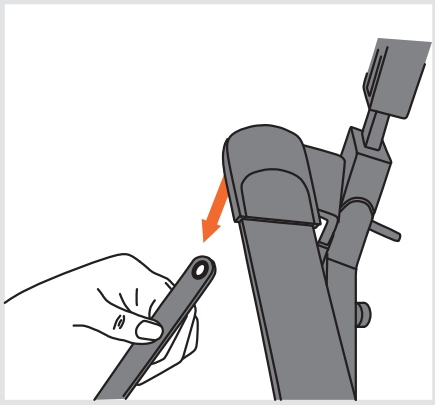
- Please contact your dealer or Skelex directly via skelex.com for disposal of the product.

Maintenance instructions: (dis-) assembly

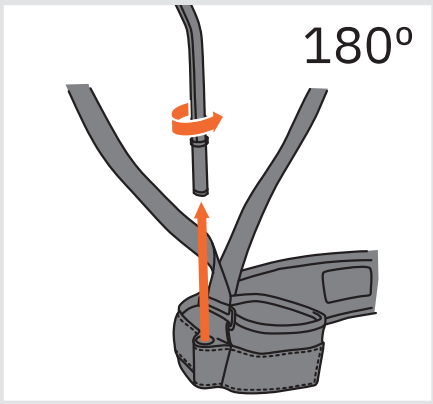


Removing the frames
There are 3 steps to remove the frames from the harness.

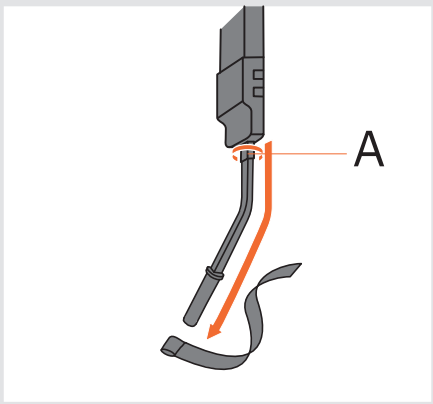
Step1
- Pull down Minax lock at the underside of the top of the spring.



- Detach the harness connectors from Minax.



Step 2
- Rotate the frame 180° and pull out the belt connector to remove the frame.

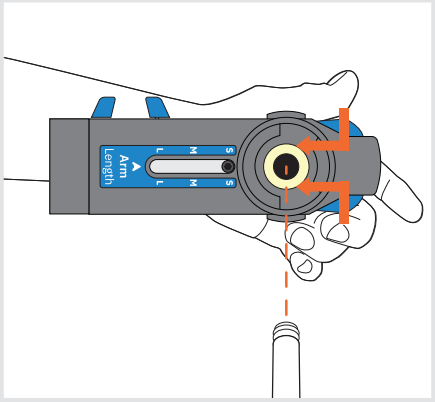


Step 3
- Remove the harness loop from the tube part of the height adjustment.
- *Repeat this for the other frame.*

Installing FlexFrames
- Follow all steps above in reverse order.
- Make sure the harness loop is in the right position at the height adjustment (A).

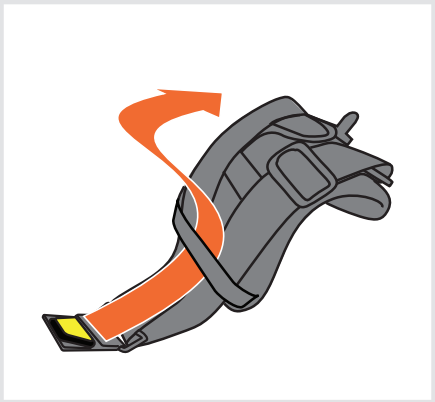
For more information and instruction videos: www.skelex.com/downloads

Maintenance instructions: (dis-) assembly

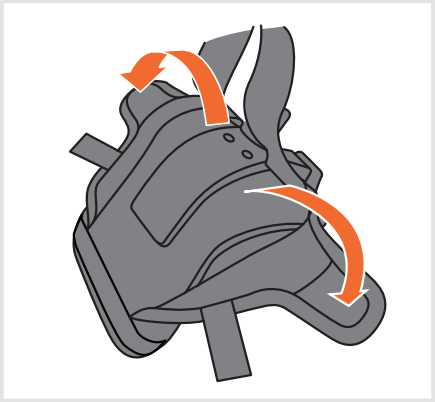


Removing the arm socks

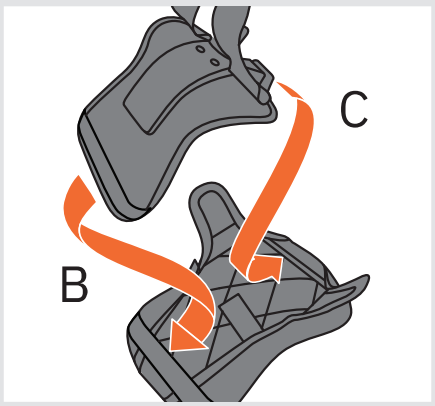
- To remove and clean the arm socks, remove both arm cups from the arms.
- To remove the arm cup, press in both blue buttons and push them in towards the arm cup axis.
- Pull out the arm cups from the arms.



- Re-route the elastic straps from the webbing.



- Open both velcro wings on the underside of the arm cup sock.
- Peel off the sock.



Assembling the arm socks

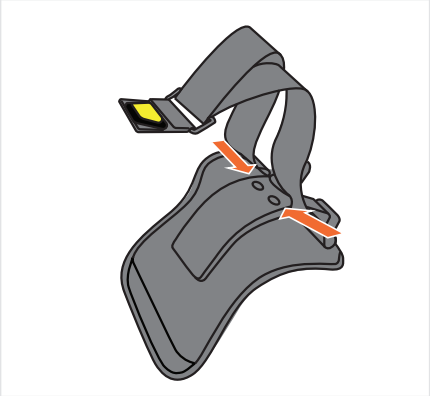
- Start with inserting the B side of the padding in the sock.
- Insert C side of the padding in the sock.
- Close both velcro wings of the sock.

For more information and instruction videos: www.skelex.com/downloads

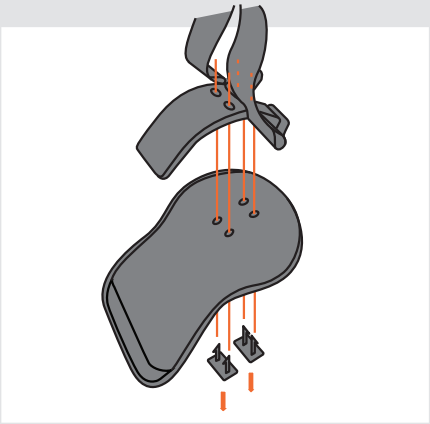
Maintenance instructions: (dis-) assembly

Replacing the EVA arm cup padding

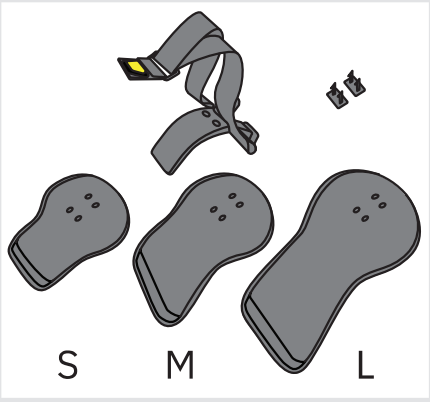
- To access the arm cup padding, first remove the arm cup from the arm.
- Re-route the elastic strap from the webbing.
- Remove sock from arm cup.



- Pinch both clickers on the outside of the arm cup and push them out the arm cup.
- EVA padding is separated from arm cup.



- Remove clickers from the EVA padding.



Follow the previous steps in reverse in order to assemble the arm cup padding

- Select the right size EVA padding: small, medium, or large.
- Place the EVA padding on the arm cup and push the clickers in the arm cup till you hear “click”.

Note: Every size EVA padding has its own length elastic arm straps. Make sure you also assemble the right length elastic straps together with the EVA padding.

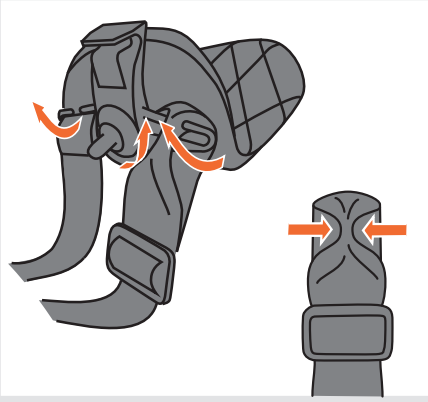
For more information and instruction videos: www.skelex.com/downloads

Maintenance instructions: (dis-) assembly

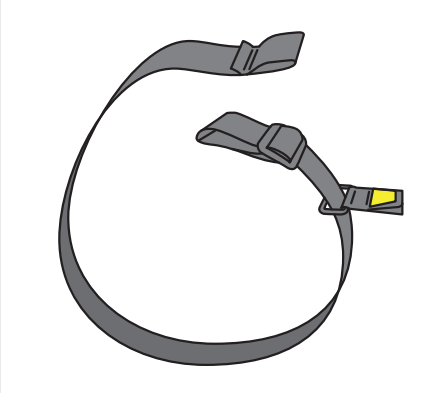
skelex

Removing the elastic arm cup straps

- For easy access, remove the arm cup.
- Re-route the elastic straps from the webbing.



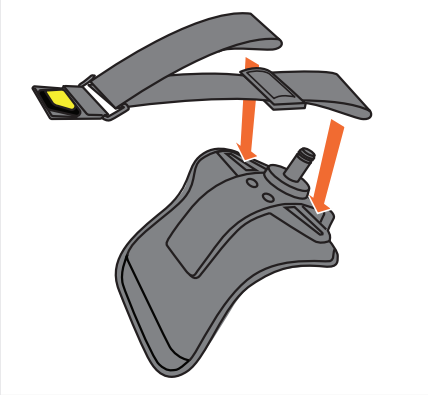
- Start with the webbing part of the (elastic) strap.
- By pinching the webbing together it is easier to remove this part of the strap from the hook.
- Remove the complete strap by removing the elastic part of the strap from the hook as well.



Assembling the arm cup strap

- Select the right length elastic strap.
- Loop the elastic strap through the GripLabel.

Note: every size arm sock and arm cup padding comes with its own length elastic strap.



- Pinch both strap loops through the arm cup hooks.

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