



# APEX™

E X O S U I T

## USER MANUAL



## **HeroWear® Apex™ Exosuit User Manual**

Applies to HeroWear Apex exosuit components with SKUs showing 121 in the third grouping.

Examples:

A-AA00-121-00

A-BN01-121-11

A-TNSM-121-11

etc.

See the product label on each component for the SKU.

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## 2 Document Version Control

To ensure you're working from the most up-to-date documentation, please refer to the HeroCare360 support website at <https://HeroWearExo.com/HeroCare360>.

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PART 1:

# **USER MANUAL**

## 3 About This User Manual

This User Manual documents the proper sizing, fitting, selection, adjustment, use, care, maintenance, storage, and disposal of your Apex exosuit.

Apex exosuit Users and Specialists must read and be familiar with the Quick Start Guide provided with each exosuit before using it for the first time.

### 3.1 Cautions for All Apex Exosuit Users

The Apex exosuit can only be used safely and reliably when the instructions contained in this User Manual and in the Quick Start Guide are followed.

Avoid working with Apex exosuits in any ways not outlined or explained in this User Manual. Doing so may lead to injuries or product damage.

Avoid reckless use, care, maintenance, or storage of your Apex exosuits.

### 3.2 Cautions for Apex Specialists

As an Apex Specialist, you should thoroughly familiarize yourself with this User Manual to properly size, fit, adjust, use, and care for your Apex exosuits, and to support others in their use.

We recommend you print and keep a copy of this User Manual and the Quick Start Guide in an accessible location at your work or job site with other safety and compliance documentation.

Make sure this User Manual, the Quick Start Guide and the HeroCare360 support website are available for all Users of the device.

### 3.3 HeroWear Contact Information

For more information, support, or clarification on any content within this User Manual, please contact HeroWear:

1056 E. Trinity Lane, Suite 102, Nashville, Tennessee, 37216  
<https://www.HeroWearExo.com/HeroCare360>  
info@herowearexo.com

## 4 Warranty

HeroWear warrants this product to be free from defects in workmanship and materials, under intended use and conditions, for a period of one (1) year from the original invoice date.

HeroWear agrees, at its option during the warranty period, to repair any defect in material or workmanship; or to furnish a repaired, refurbished, or new product of equal value in exchange without charge except for a fee for shipping, handling, packing, return postage, and insurance, which will be paid by the customer.

Such repair or replacement may be subject to verification of the defect or malfunction, and proof of purchase as confirmed by showing the model number on original dated sales receipt.

## 4.1 Limitations of This Warranty

### **HeroWear cannot cover:**

- Normal wear and tear, including color fading, which can be caused by overexposure to sunlight
- Product damage or failure resulting from any use for which the product was not intended
- Product damage or failure resulting from incorrect or inadequate assembly, storage, maintenance, or care
- Product damage or failure from misuse, abuse, negligence, accidents, or shipping damage
- Dissatisfaction due to buyer's remorse
- Damages incurred during transportation by the User to and from the worksite

## 4.2 No Other Warranties Made or Implied

HeroWear makes no express warranty or condition whether written or oral and HeroWear expressly disclaims all warranties and conditions not stated in this limited warranty. To the extent allowed by the local law of jurisdictions outside the United States, HeroWear disclaims all implied warranties or conditions, including any implied warranties of merchantability and fitness for a particular purpose. For all transactions occurring in the United States, any implied warranty of condition of merchantability, satisfactory quality, or fitness for a particular purpose is limited to the duration of the express warranty set forth above.

## 4.3 Time Limits May Not Apply

Some states or countries do not allow a limitation on how long an implied warranty lasts or the exclusion of limitation of incidental or consequential damages for consumer products. In such states or countries, some exclusions or limitations of this limited warranty may not apply to the Purchaser. For consumer transactions, the limited warranty terms contained in this statement, except to the extent lawfully permitted, do not exclude, restrict, or modify but are in addition to the mandatory statutory rights applicable to the sale of this Product to the Purchaser.

## 4.4 Warranty Claims

All warranty claims must be filed by the original purchaser of this product with the authorized distributor, seller, or retailer of this product, who in turn is to contact the manufacturer (HeroWear, LLC) regarding any warranty return or replacement.

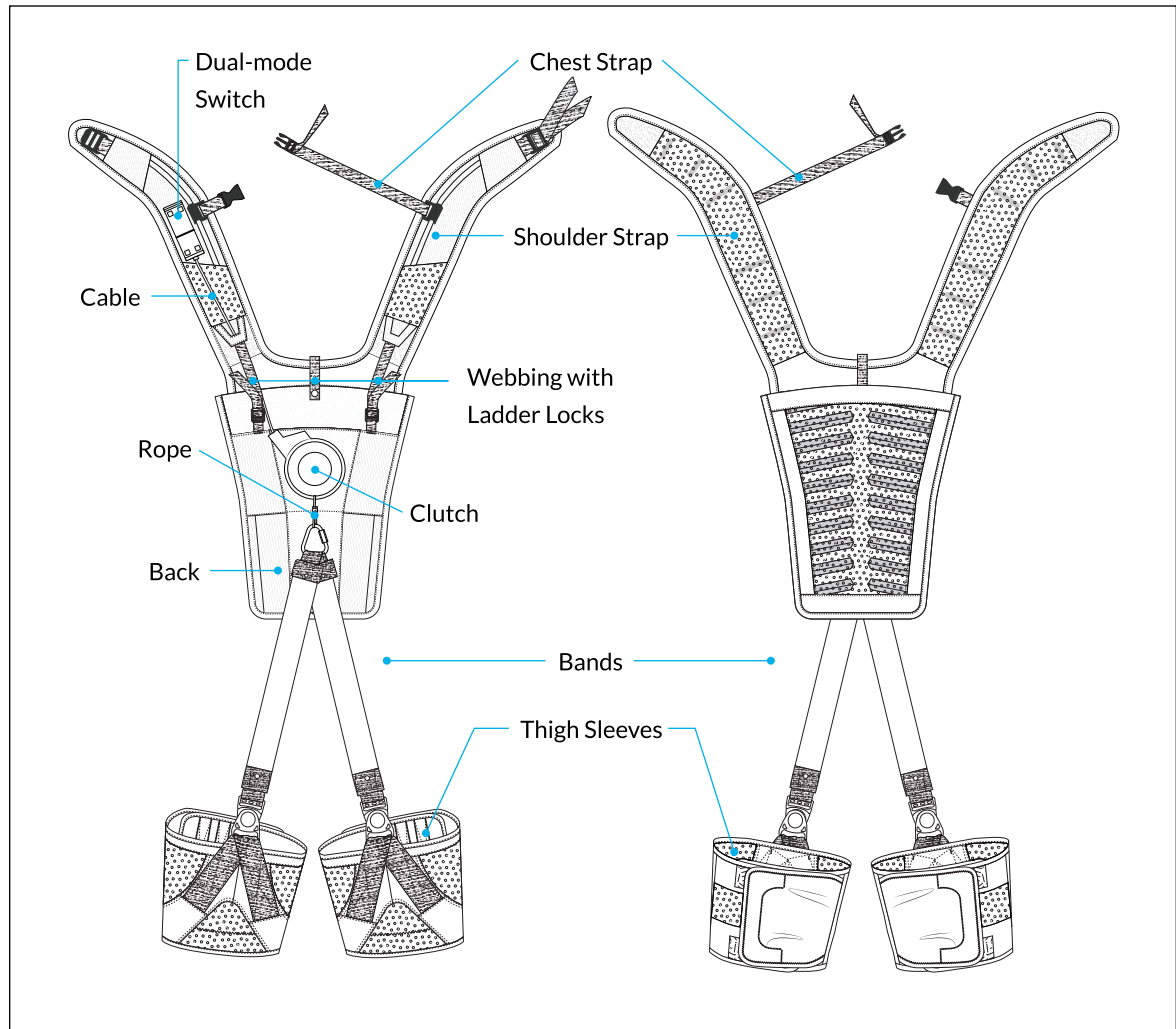
Please retain invoices for a minimum of one year for warranty purposes.

# 5 About the Apex Exosuit

The Apex is an occupational exosuit designed to reduce strain, fatigue, and injury risk for the low back during work that requires the User to bend, lean, stoop, squat, or lift. The Apex exosuit has a proprietary, patent pending dual mode Switch to engage and disengage passive support and assistance provided by its elastic bands.

**The Apex exosuit does not increase strength, allow Users to lift loads that are heavier than they can typically lift, or prevent injuries that arise from improper lifting techniques.**





The Apex's Shoulder Straps and Back components are worn like a backpack. The Thigh Sleeves are worn around the thighs in a manner similar to athletic equipment like thigh pads or thigh compression garments.

The upper and lower body components are connected with high-strength elastic Bands which stretch as the User bends, leans, stoops, squats or lifts. The Bands shorten when the User stands upright or lifts. It is this stretching/shortening action which assists the user when bending and lifting objects.

When the Apex's lift assistance is not needed, the Bands can be disengaged by the User using the Shoulder Strap-mounted Dual-mode Switch to deactivate the Clutch. Doing so allows the User to freely move about, climb, sit, or crawl.

## When to Use the Apex's Lift Assistance.

### Lift Assistance ON

- Bending
- Stooping
- Squatting
- Lifting
- Leaning forward
- Apex exosuits can be used for all of the above while standing or kneeling
- Lift assistance can remain on while walking short distances between bends or lifts, and while stepping on and off certain equipment (standing forklifts, electric pallet jacks, etc.)

### Lift Assistance OFF

- Walking long distances
- Running
- Climbing stairs, ladders, or scaffolding
- Sitting
- Operating equipment from a seated position (forklifts, tractors, etc.)
- Lying down
- Crawling
- Other awkward positions or movements where back assistance is not needed

### The Apex exosuit is not intended to be used in the following ways:

- Without cleaning, sanitization, or decontamination by qualified staff
- Without User-specific fitting and adjustment by qualified staff
- Without inspecting, repairing, or refurbishing by qualified staff
- Without training by qualified staff
- To increase performance or productivity
- To lift people or very heavy objects that cannot be otherwise lifted safely by the User without the Apex

## 6 Setting Up the Apex Exosuit

When your Apex exosuit arrives from HeroWear, initial assembly will be required before first use.

### Unpacking

1. Open the boxes containing the Apex components carefully. If using a box knife to cut the boxes open, be sure not to cut too deep because this can damage the Apex.
2. The Shoulder Straps, Switch, Back, and Clutch are shipped pre-assembled.
3. Turn the Apex over so the Clutch is facing up and the Shoulder Straps are toward you.
4. Note the directionality of the Bands. Sewn together at the top, one of the Bands will angle towards the right thigh while the other angles towards the left thigh.
5. Clip the Bands to the loop at the bottom of the Clutch housing. When connecting the Bands, be sure to clip them onto the loop so that the convex sides of the clips face away from the User's body.
6. Attach the Bands to the Thigh Sleeve clips.
7. Labeling each exosuit with the intended User's name or initials is recommended. Use a permanent marker to print the user's name in the white portion of the silicone HeroWear patch. Press the patch's hook and loop fastener securely into place on the right Shoulder Strap.
8. Initial assembly is complete and the Apex is ready for issue to its User.

# **7 Putting On (Donning) and Using Your Apex Exosuit**

Your Apex exosuit has been built and sized so you can wear it comfortably for a full work shift. Putting on (donning) your Apex properly will ensure your exosuit works as intended, and that you remain comfortable all day.

1. Perform visual inspection daily prior to use of the Apex exosuit (see Chapter 11 - Section 11.1 Daily Inspection).
2. After inspection, put on the Apex exosuit like a backpack, beginning with the Shoulder Straps/ Back.
3. Clip the chest strap, then tighten both shoulder straps first, like a backpack. Then tighten the chest strap. The fit should be snug but comfortable.

4. Toggle the switch on the left Shoulder Strap to OFF (disengaged) position, by pushing the button as shown.



Switch shown in OFF position.

5. Ensure the Bands aren't twisted before putting the first Thigh Sleeve on.
6. The label on the inside of each Thigh Sleeve will indicate its size and which thigh it goes on. The black Clip on the back of the Thigh Sleeve should always point upward, closest to the buttocks
7. Wrap the inner end of the Thigh Sleeve on the upper thigh, as high up the thigh as possible. Align the Thigh Sleeve Clip so it is centered on the back of the thigh under the buttock. ("A" in figure)
8. Firmly pull the outer Thigh Sleeve end over the inner portion and press together to completely engage hook and loop fastener.
9. Pull the elastic outer cover over the front of the Thigh Sleeve and press the hook and loop fastener to secure it in place. ("C" in figure)
10. Repeat for both legs. ("D" in figure)



## Adjusting the Apex

While wearing the exosuit, if at any point the device loses the proper adjustment, or needs to be readjusted, Users should stop what they are doing and adjust the fit.

- Back — There are no adjustments necessary for the Back.
- Shoulder Straps — The Shoulder Straps are adjusted like a backpack.
  - Tighten or loosen the Webbing that connects the ends of the Shoulder Straps to the bottom of the Back just like a backpack.
  - The top of the Shoulder Straps should lay right below the User's shirt collar in the back. When adjusted properly, the top of the Switch should be located at about the level of the User's collarbone (clavicle).



Shoulder Straps adjusted correctly (left) and incorrectly (right).

- Thigh Sleeves
  - To adjust the Thigh Sleeves, undo the hook and loop fasteners and re-secure so they are snug and do not slide up or down the thigh.



The Thigh Sleeves properly worn and adjusted.

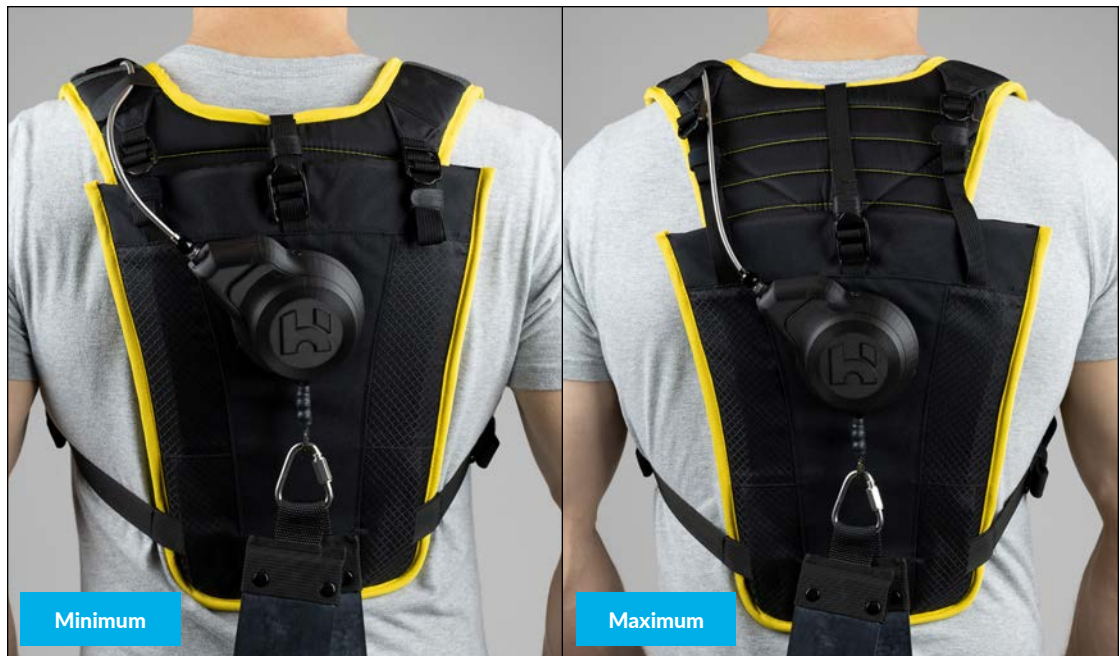
- Bands — In most cases, there should not be excessive slack in the Bands when the User is standing upright. Loose Bands will delay the activation of the Apex's lift assistance and prevent the User from getting optimal support.
  - This is especially important when standing nearly upright, and bending and lifting early in the range of motion.



Improper band length showing bands that are too short (left) and too long (right).

- As the User stands, note that they do not feel the Apex pulling down on their shoulders.
- Also make sure there is very little slack in the Bands, so that as soon as the User begins to bend or lift, they will feel their support and assistance.
- The Apex's Back and Band lengths can be adjusted by lengthening or shortening the amount of Shoulder Strap coming out of the top portion of the Back component.
  1. To make this adjustment, first loosen the three (3) Webbing straps at the top of the Back component.
  2. Next, separate the Shoulder Straps from the Back by undoing the hook and loop fastener. Slide the Shoulder Straps into or out of the Back to adjust to the length appropriate for the User.
  3. This will allow the user to adjust the length by about 4 inches.
  4. Re-attach and tighten the Webbing straps to secure the Shoulder Straps to the Back.
- Longer Bands are needed if the Bands are still too short after the Shoulder Straps and Back have been adjusted to their maximum length.
- Shorter Bands are needed if the Bands are still too long after the Shoulder Straps and Back have been shortened to their minimum length.



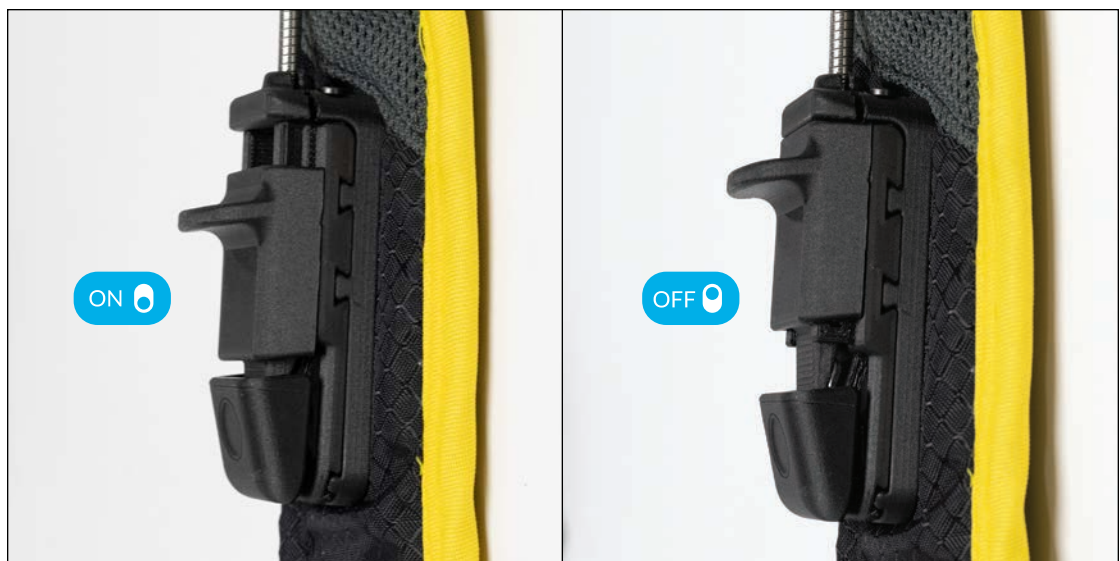


Shoulder Straps adjusted to their minimum (left) and maximum (right) lengths.

## 7.2 Using the Switch to Operate the Apex

When assistance from the Apex's Bands is needed, use the Switch to engage the Bands.

1. **NOTE:** The User must stand upright **before** operating the Switch to engage or disengage the Bands.
2. Stand upright and slide the Switch downward from the top until it locks into the ON (engaged) position.
3. When assistance is not needed, stand upright, press the button and the Switch will slide upward until it reaches the OFF (disengaged) position.



Switch shown in ON (left) and OFF (right) positions.

4. To test the Apex for proper functioning, begin with the Switch in the upward or OFF position.
5. Bend, squat and march in place to ensure that the rope slides easily in and out of the Clutch with each movement.

In OFF (disengaged) mode, if the rope does not slide freely out of or back into the Clutch, take the exosuit out of service and contact HeroWear.

6. Now stand upright and slide the Switch down into the ON position.
7. Bend, squat, and march in place to ensure the rope does not move out of the Clutch housing and that the Bands can stretch with each movement.

In ON (engaged) mode, if the rope slides in and out of the Clutch as if it is still in OFF (disengaged) mode, take the exosuit out of service and contact HeroWear.

### 7.3 Wear Schedule

HeroWear recommends consulting an ergonomics or safety professional with experience managing the use of exoskeletons in the workplace for assistance with the development of appropriate wear schedules for Apex exosuit Users.

- Wear schedules can vary somewhat depending on the Users and their jobs.
- HeroWear recommends the following wear schedule as a general rule of thumb for brand new Users of the Apex exosuit:
  - Week 1: Use for half of the needed duration (such as 60 minutes on, 60 minutes off throughout the work shift).
  - Week 2: Use for three quarters of the needed duration (such as 90 minutes on, 30 minutes off throughout the work shift).
  - Week 3: Use full-time, with breaks as needed.

## 8 Taking Off (Doffing) Your Apex Exosuit

To take off the Apex exosuit, make sure the suit is in the OFF (disengaged) mode, and begin by unfastening the Thigh Sleeves' hook and loop fasteners. Leave the Bands clipped in place.

Next, unclip the chest strap and take the Apex exosuit off like a backpack.

**Note:** Perform visual inspection after use of the Apex exosuit daily (see Chapter 11 - Section 11.1 Daily Inspection).

### 8.1 Storage & Transport

- Store the Apex exosuit on a hanger or rack, with sufficient airflow to allow the devices to dry thoroughly if wet.
- Protect the exosuit from dust, moisture, extreme temperatures (lower than -4° Fahrenheit or higher than 122° Fahrenheit), and large temperature fluctuations by storing it in an area not subject to these conditions.
- Do not cover the Apex in a manner that impedes airflow as doing so may allow bacteria growth.



- Improper storage may cause product damage or increased wear and tear. These conditions may void the warranty.
- No special handling is required to transport the Apex exosuit.
- No personal protective equipment is required for transporting the Apex exosuit.

## 8.2 **Typical Wear Time and Service Life**

The typical wear time for the Apex exosuit is 8 hours per day.

The expected service life of the Apex exosuit will vary based on the amount and type of use; the environments where it is used; and adherence to the recommended care and maintenance procedures outlined in this manual.

Longer daily use, and use in harsh environments will increase wear and tear on the Apex and reduce its service life.

## 8.3 **Apex Reuse**

During its service life, the Apex exosuit can be reused/reassigned to different Users under the following circumstances:

- The Apex should be sanitized and cleaned thoroughly prior to reuse/reassignment.
- Verify any size differences for Shoulder Straps, Thigh Sleeves and Bands, if the suit is being reassigned (see Chapter 14: Selection, Sizing and Fitting).
- The Apex should be inspected by trained, authorized, qualified staff with respect to its condition, wear and tear, and/or damage.
- All worn or damaged components should be replaced prior to reissue.

Information on inspection, maintenance, repairs, and required supplies can be found elsewhere in the [Inspection, Storage, Care & Maintenance](#) section, beginning on page 27 of this manual.

## 9 Disassembly of the Apex

On occasion, you may need to completely disassemble the Apex for deep cleaning, maintenance, or to change certain parts. Follow these instructions to do so.

1. Disconnect the Thigh Sleeves from the Bands.
2. Disconnect the Bands from the Clutch loop.
3. Loosen the Switch's thumbscrew to free the Switch assembly from the left Shoulder Strap. Gently pull the outer housing of the Bowden cable out of the Switch then slide the Switch off of the Strap. As soon as the Switch is removed from the Strap, slide the Switch to the ON (engaged) position, and thread thumbscrew back into the Switch, to keep the Switch components together.  
**IMPORTANT: Be sure to lock the Switch after removal to prevent exposing the sharp end of the Bowden cable. Do not let the Bowden cable whip through the air.**
4. Pull any coiled webbing free from the Webbing Keepers.
5. Slide the Shoulder Strap webbing out of the Ladder Lock securing it. Repeat for all three Ladder Locks that connect the straps to the back.
6. Disconnect the two (2) Ladder Locks at the ends of the Shoulder Straps from the 1" webbing from the bottom portion of the Back.
7. Pull apart the hook and loop fastener connecting the Shoulder Straps and Back, and remove the Shoulder Strap from the pocket. The Shoulder Straps and Back are now separated.
8. Slide the locked Switch deeply into the inside pocket of the Back and reattach the center Webbing Strap to the Ladder Lock in the center of the Back to prevent the Bowden cable from excess movement during cleaning or maintenance.

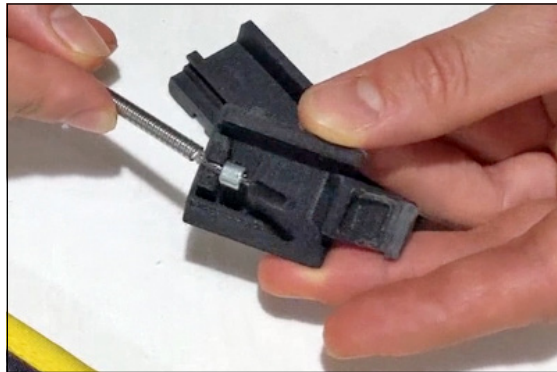
## 10 Reassembly of the Apex

1. Begin by laying the parts out on an open area, such as an empty table, desk, workbench, or the floor.
2. Remove the Webbing Strap from the center of the Back that is holding in the Switch and Bowden cable. Carefully and slowly remove the Switch from inside the Back.
3. With the Strap's shoulder padding facing down, insert the end of the Shoulder Strap into the center of the Back pocket.
4. Align the Shoulder Strap's yellow stitching with the top of the Back pocket. Then press firmly to secure the hook and loop fastener in place.
5. Install one Webbing Keeper onto each webbing band before threading the Ladder Locks.
6. Thread the three (3) Ladder Locks at the top portion of the Back with the 2" webbing straps. The two (2) upper webbing straps connect the Shoulder Strap component to the Back. The center webbing band secures the Shoulder Straps.
7. Thread the two (2) Ladder Locks at the ends of the Shoulder Straps with the 1" webbing from the bottom portion of the Back.

8. Use the Webbing Keepers to manage excess webbing.

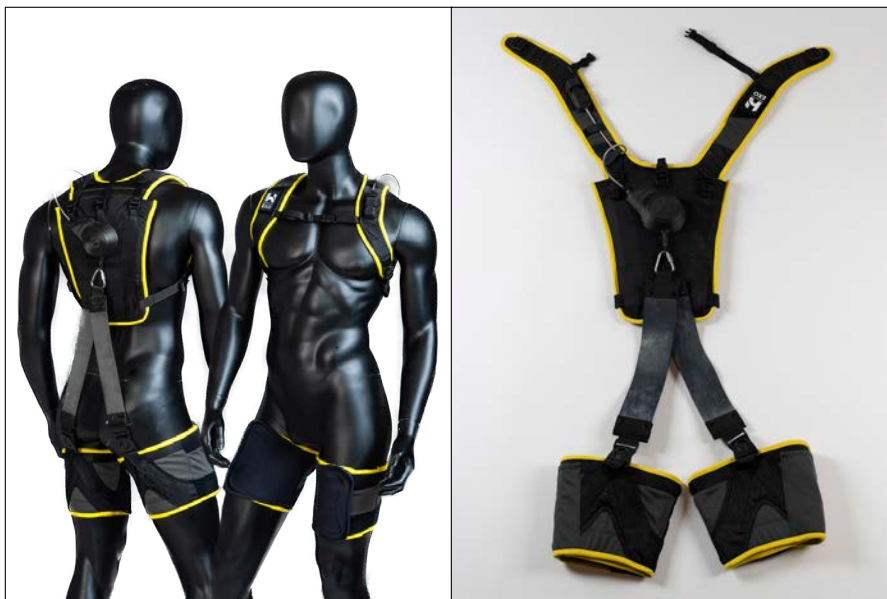


9. Now place the Apex so the Back and Clutch face up.
10. While gently pulling on the Bowden cable, reattach the Switch by sliding the Switch assembly onto its mounting plate, guiding the cable into its slot on the Straps. Secure with the thumbscrew.



11. Reattach the Bands to the Clutch carabiner and Thigh Straps.

The images below show the Apex properly assembled.



# 11 Inspection, Storage, Care & Maintenance

## 11.1 Daily Inspection

Visually inspect your Apex exosuits daily. Be on the lookout for the following conditions:

1. Wear and tear on soft fabric components of the Apex exosuit such as the Straps, Webbing, Back, and Thigh Sleeves
2. Wear and tear on Thigh Sleeve's hook and loop fastener material
3. Broken or worn Buckles
4. Ripped, cut or fraying webbing adjustment straps
5. Cracked, broken or worn Bands
6. Wear and tear on the thin rope exiting the Clutch housing
7. Inability of the rope to enter and exit the Clutch housing
8. Cracked or broken Switch
9. Cracked or broken Clutch
10. Cut, broken or detached Cable between Switch and Clutch housing

In the event that any of the above issues are identified during inspection, remove the exosuit from use, take pictures of the problem, and contact HeroWear.

For items 1-3 above, depending on their severity the Apex may stay in use if the problem is largely cosmetic. For all of the others, or if items 1-3 are severe, remove the Apex exosuit from use and contact HeroWear.

## 11.2 Weekly/Monthly/Other Inspection

In addition to the Daily Inspection described above, make the following checks:

1. Visually inspect the Bands, followed by stretching them manually, checking for cracks, tears, or other damage.
2. Visually inspect the mechanical system for any cracks, dents, or loose fasteners.
3. To test system functionality, don the exosuit.
4. Slide the Switch to OFF (disengaged) mode.
5. Move through the range of motion typically experienced in your work environment in OFF or disengaged mode.
6. Press down on the Switch to engage and change it to ON (engaged) mode.
7. Move through the range of motion typically experienced in your work environment in engaged mode.
8. Observe any unusual sounds, vibrations, or unusual behavior in both disengaged and engaged mode from any system component.
9. If inspection reveals an area of concern, please contact your Supervisor for further guidance.

In the event that any of the above issues are identified during inspection, remove the exosuit from use, take pictures of the problem, and contact HeroWear.

## 11.3 End of Life and Retirement Considerations

If any portion of the suit appears damaged and unusable contact your supervisor and/or HeroWear for a replacement component.

## 11.4 Device History

The full history of each Apex exosuit's wear, use, care, and maintenance should be documented. HeroWear has provided a template for use, available for download here - <https://HeroWearExo.com/tracker>.

# 12 Maintenance & Disposal

1. Replace Switch and/or set screw using the procedures below if failure occurs.
  - To Remove: Loosen the Switch's thumbscrew to free the Switch assembly from the left Shoulder Strap. Gently pull the outer housing of the Bowden cable out of the Switch then slide the Switch off of the Straps. As soon as the Switch is removed from the Strap, slide the Switch to the ON (engaged) position and thread thumbscrew back into the switch to keep the Switch components together. **IMPORTANT: Be careful to lock the Switch after removal to prevent exposing the sharp end of the Bowden cable. Do not let the Bowden cable whip through the air.**
  - To Reinstall: While gently pulling on the Bowden cable, reattach the Switch by sliding the Switch assembly onto its mounting plate, guiding the cable into its slot on the Straps. Secure with the thumbscrew.
2. Replace assistive Bands as needed, based on regular inspection and/or performance.
3. Replace any Thigh Sleeves or Shoulder Straps if hook and loop fasteners no longer hold tight or if there is excessive fraying of Webbing, Straps, or buckles.

Your Apex needs no other maintenance. If any other failures occur, contact HeroWear.

There are no special considerations for Apex disposal. Old Apex exosuits can be returned to HeroWear for disposal. Or follow local guidelines and regulations for disposal of the Apex components in trash and/or recycling.

# 13 Sanitizing and Cleaning

Check the care labels on the Apex exosuit components.

HeroWear recommends daily sanitization with a non-bleaching sanitizing fabric spray after each use.

Apex exosuits should be properly cleaned, sanitized, disinfected and/or decontaminated regularly.

If available, waterless ozone cabinet disinfection and/or decontamination is recommended as follows:

- Single-User Apex exosuits — Weekly
- Multi-User Apex exosuits — Daily

For a list of cleaning supplies tested and approved for use on Apex exosuits, please refer to the [Care section of HeroWearExo.com](#).

Cleaning and sanitizing Apex exosuits with products other than those recommended may cause damage to the product and void the warranty. For specific sanitizing/cleaning product details, direct inquiries to their manufacturer.

## 13.1 Daily Sanitizing Instructions

- With the Apex hanging on a hanger, spray it well with a sanitizing solution, avoiding directly spraying the Switch, Cable or Clutch.
- Disinfectant wipes may be safely used to wipe, clean and sanitize the Switch, Cable, Clutch, Clips, Ladder Locks and Buckles.
- Ensure adequate airflow around the exosuit, and allow it to air dry thoroughly before the next use.
- After daily sanitization, ensure that Users do not touch or come in contact with exosuits in any way that can potentially contaminate them through coughing, sneezing or breathing on them, or physically touching them. If this occurs, be sure to sanitize them before the next use by the User.

## 13.2 Periodic Cleaning

Perform as needed or when the Apex becomes visibly dirty.

### Option 1 – Machine Washing:

- DO NOT machine wash the Back of the Apex exosuit (including the Switch).
- Ensure the Clutch is in OFF (disengaged) mode.
- Ensure the Clutch is in OFF (disengaged) mode, then remove the Switch from the Shoulder Strap.
- Remove the Shoulder Straps from the Back, disconnect the Thigh Sleeves from the Bands, and remove the Bands from the Back.
- Place the Straps and Thigh Sleeves inside a laundry sack and machine wash using mild detergent in cold or warm water using the gentlest cycle possible. Do not use hot water.
- The Back and Bands can be hand washed with a moist, soapy rag (mild detergent with cold or warm water). Take care to avoid wetting the Switch and Clutch, however, which should be cleaned with a disinfectant wipe.
- The Switch, Clutch, Cable, Clips, Ladder Locks and Buckles can be wiped clean with moist, soapy rag or disinfectant wipe. Take care not to get these components wet or submerge them.
- Air dry wet components thoroughly.

### Option 2 – Hand Washing:

- Ensure the Clutch is in OFF (disengaged) mode.
- Ensure the Clutch is in OFF (disengaged) mode, then remove the Switch from the Shoulder Strap.
- Remove the Straps from the Back, disconnect the Thigh Sleeves from the Bands, and remove the Bands from the Back.
- The Straps, Thigh Sleeves, Back and Bands can be hand washed with a moist, soapy rag (mild detergent and cold or warm water).
- Take care to avoid wetting the Switch and Clutch, however, which should be cleaned with a disinfectant wipe.
- The Switch, Clutch, and Cable can be wiped clean with moist, soapy rag or disinfectant wipe. Take care not to get these components wet or submerge them.
- Air dry wet components thoroughly.

The above sanitization and cleaning instructions should be effective for cleaning/sanitizing the Apex exosuit after being exposed to dust, dirt, mud, and other forms of physical contamination.

These instructions should also be effective for biological contamination such as most known bacteria, viruses, fungi, mold and other types of germs.

These instructions may not be effective for removing all types of radioactive or chemical contamination such as oil, grease or other types of chemicals that might come in contact with the Apex exosuit. Consult an expert or contact the chemical manufacturer with questions.

PART 2:

# **ADVANCED FITTING, CARE, AND SAFETY INSTRUCTIONS**

# 14 Selection, Sizing and Fitting

Apex Specialists must read, understand, and perform the following procedures to ensure the Apex exosuit performs correctly. Sizing, fitting, and adjusting should only be performed by qualified HeroWear staff or Apex Specialists.

## 14.1 General Information on Sizing, Fitting, and Adjusting the Apex Exosuit

- An Apex exosuit Fit Kit is recommended to identify the correct size exosuit components for fitting new Apex Users.
- Apex Specialists should be trained prior to performing sizing, fitting, and adjustment of Apex exosuits for themselves and/or other Users.
- Contact HeroWear in the event that components do not properly fit individual Users, or if extra components are needed.
- Use the recommended measurements and size chart to identify the correct size exosuit components when you place your order.

## 14.2 Before Sizing, Fitting and Apex Exosuit Selection

It is recommended that sizing, fitting, and adjustment be performed in a private, quiet, adequately sized space, separate from the User's typical workplace and job duties.

## 14.3 How to Size and Fit Users with an Apex Exosuit (Strongly Recommended)

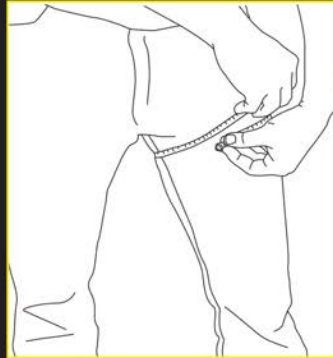
1. The following are needed to size and fit Users with an Apex exosuit.
  - Users
  - Apex exosuit Fit Kit or Apex devices (optional but recommended)
  - Soft tape measure
  - Pen or pencil and paper
  - Sizing, Fitting & Selection Instructions (see below)
  - Apex Size Chart (see below)
  - Training on how to assemble an Apex exosuit (see [Setting Up The Apex Exosuit](#), Section 10)
  - Computer, tablet or smartphone for electronic documentation (optional but recommended)
2. Measure each User, recording their measurements on the Sizing, Fitting and Selection Form, then identifying their Apex component sizes using the Size Chart below.



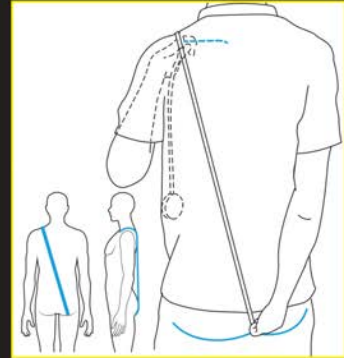
# APEX™ EXOSUIT Measurement Guide



Your chest circumference is measured 2" (5 cm) below your armpits.



Your thigh circumference is measured 3" (7.5 cm) below the groin, on the side of your dominant thigh.



Start your back measurement at the bottom of your right buttock (gluteal fold) then take the tape over your left shoulder to bottom of your left collarbone (clavicle).

User ID / Name	Gender	Height	Weight	Waist / Pant Size	Chest Measurement (for Shoulder Strap Size)	Thigh Measurement (for Thigh Sleeve Size)	Back Measurement (for Band Size)

- NOTE:** Taking measurements can be a sensitive area for certain Users. Take extra care to explain exactly what you need to do and why, and avoid making accidental physical contact with sensitive body parts.

If using a Fit Kit, always clean and sanitize the Fit Kit components used after each User is finished, and before introducing them to another User.

## Apex Exosuit Component Size Chart

Part	Measurement	Sizes					
Back	NA	1 size fits all					
Women's Shoulder Straps	Chest circumference measured 2" (5cm) below armpits	Small: 26-41" (66-104cm)			Large: 41-49" (104-123cm)		
Men's Shoulder Straps	Chest circumference measured 2" (5cm) below armpits	Small: 28-45" (71-114cm)			Large: 42-54" (107-137cm)		
Thigh Sleeves	Dominant thigh circumference measured 3" (7.5cm) below groin	Small*: 18.75-23.6" (48-60cm)		Medium*: 22-28.5" (56-72cm)		Large*: 26.75-34.5" (68-88cm)	
S1000 Bands (Medium)	Bottom of right buttock (gluteal fold), over the left shoulder, to bottom of left collarbone (clavicle)	Length 1 29.5-32.5" (75-83cm)	Length 2 31.5-34.5" (80-88cm)	Length 3 33.5-36.5" (85-93cm)	Length 4 35.5-38.5" (90-98cm)	Length 5 37.5-40.5" (95-103cm)	Length 6 39.5-42.5" (100-108cm)
S1500 Bands (Strong)	Bottom of right buttock (gluteal fold), over the left shoulder, to bottom of left collarbone (clavicle)	Length 1 29.5-32.5" (75-83cm)	Length 2 31.5-34.5" (80-88cm)	Length 3 33.5-36.5" (85-93cm)	Length 4 35.5-38.5" (90-98cm)	Length 5 37.5-40.5" (95-103cm)	Length 6 39.5-42.5" (100-108cm)
S2000 Bands (Extra Strong)	Bottom of right buttock (gluteal fold), over the left shoulder, to bottom of left collarbone (clavicle)	—	Length 2 31.5-34.5" (80-88cm)	Length 3 33.5-36.5" (85-93cm)	Length 4 35.5-38.5" (90-98cm)	Length 5 37.5-40.5" (95-103cm)	Length 6 39.5-42.5" (100-108cm)

\*Small Thigh Sleeves were previously labeled "S/M" and Medium Thigh Sleeves were previously labeled as "L/XL"

**Note:** We also recommend using our mobile-friendly online Sizing Calculator, available here - <https://HeroWearExo.com/sizing>

## Using the Apex Fit Kit

As an Apex Specialist, you can use the Fit Kit in a variety of ways.

- Sizing, Fitting, and Apex Exosuit Selection. The Fit Kit is designed to help you identify the correct size components for individual Users before ordering. Measurements can be verified by having Users try on selected components during Fitting.
- Short- and Long-Duration Field Testing. Fit multiple Users of varying sizes, shapes and genders with a properly sized Apex exosuit to test for a short period of time (minutes or hours) or long periods (days, weeks or months) on the job.

Be sure to sanitize the Apex exosuit thoroughly between Users. See [Sanitizing and Cleaning](#) (Section 8) for more information on proper cleaning, sanitizing and decontamination procedures.

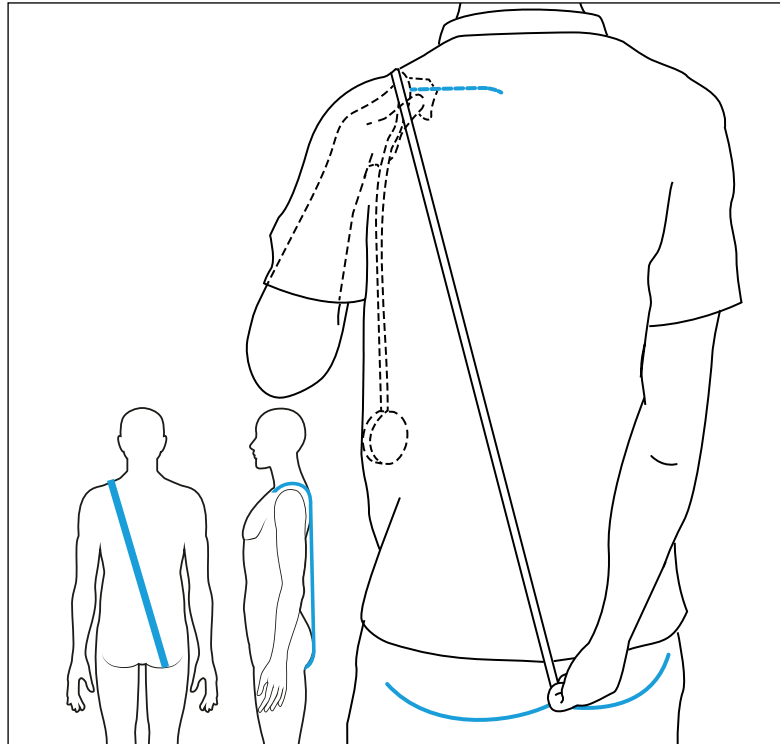
- Research. Fit Kits are well suited for research purposes where numerous Users of varying sizes, shapes and genders will be tested with the Apex.

See considerations for short and long duration testing in regards to effective Apex exosuit cleaning, sanitization and decontamination between Users.

- Sizing, Fitting, and Apex Exosuit Selection. The Fit Kit is designed to help you identify the correct size components for individual Users before ordering. Measurements can be verified by having Users try on selected components during Fitting.

1. User should stand with feet about shoulder width apart.

2. Measure and record Chest Circumference 2" (5cm) below the armpit. Ask the User to assist by having them hold the end of the tape measure at the center of their chest so you can wrap the tape measure around their body without making unnecessary physical contact.
3. Measure and record Thigh Circumference around the larger thigh 3" (7.5cm) below the groin. Ask the User to assist by having them holding the end of the tape measure on the front of their thigh so you can pass it through their legs without making unnecessary physical contact.
4. Measure and record the distance from the bottom of the right buttock (gluteal fold), up and across the back, over the left shoulder to the bottom of the left collarbone (clavicle). Ask the User to assist by having them holding the zero (0) mark of the tape measure at the bottom of their right buttock to avoid making unnecessary physical contact.



5. Using the measurements and visual observation of the User's body shape and size, select the appropriate Shoulder Straps from the Fit Kit, attach them to the Back, then ask the User to put them on and adjust as needed for proper fit.
  - Guide the User in donning the Apex using the instructions for [Putting On \(Donning\) and Using your Apex exosuit](#) (Section 6) of this manual.
  - If the selected size doesn't fit properly, reselect the appropriately sized Shoulder Straps and repeat the process.
6. Next, select the appropriate Thigh Sleeves, ask the User to put them on, and adjust as needed for proper fit.
  - If the selected size doesn't fit properly, reselect the appropriately sized Thigh Sleeves and repeat the process.
  - In the unlikely event that the User requires two different-sized Thigh Sleeves, document this and bring to the attention of HeroWear staff to be addressed in the order.
7. Next, select the appropriate Bands and connect them to the Back and Thigh Sleeves. Allow the

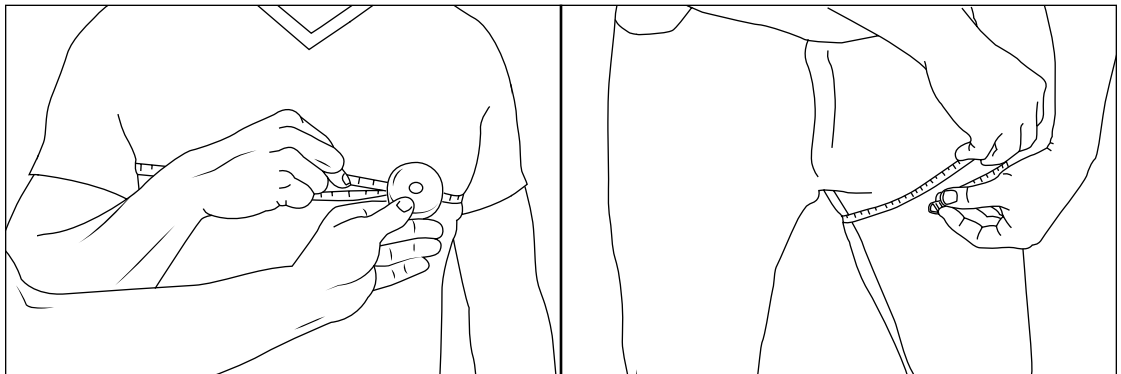
User to try both strengths, and pick the one they prefer.

8. Attach the User-selected Bands to the Apex's Clutch loop and Thigh Sleeve Clips. Adjust the Back by lengthening or shortening the webbing and Shoulder Straps as needed for proper fit.
9. Have the User practice using the Switch to engage and disengage the Apex exosuit.
  - Ask the User to slide the Switch to ON (engaged) then perform bending, leaning, squatting, lifting, and walking movements. Now ask them to press the Switch button to change to OFF (disengaged) and perform the same movements to feel the difference of when the Bands are engaged.
  - Ask the User's feedback on whether they think the Bands are the correct length and give the correct level of assistance for their work tasks.
  - If the selected Bands provide too much or too little assistance while lifting; if they pull down on the User's shoulders when the User is standing relaxed; or if they are overly restrictive while walking, try to adjust the webbing and Straps to lengthen or shorten the system. If this doesn't work, take the Bands off the Apex exosuit and replace them with a more appropriate Band.
  - Adjust the selected documented Band length and strength on the Sizing, Fitting and Selection Table as needed.
10. Answer any User questions once the measurements, sizing and fitting are complete.
11. To set expectations, inform the User of the next steps and the schedule for Apex exosuit delivery and User training.
12. Repeat these steps with all Users who will be wearing an Apex exosuit until everyone has been fit, all measurements are documented, and all components and sizes are selected.

## 14.6

### Taking the User's Measurements Without the Apex Exosuit Fit Kit

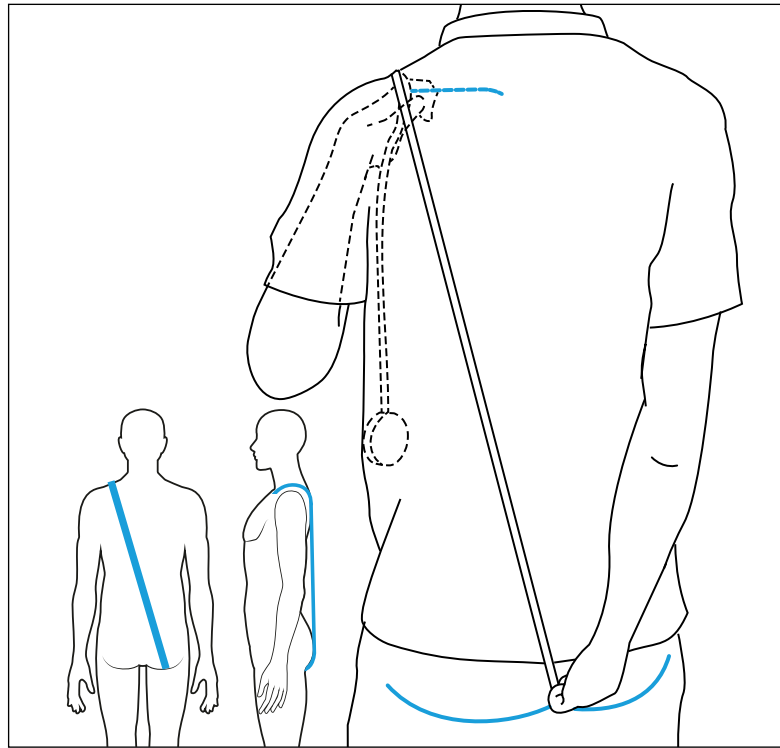
1. User should stand with feet about shoulder width apart.
2. Measure and record Chest Circumference 2" (5cm) below the armpit. Ask the User to assist by having them hold the end of the tape measure at the center of their chest so you can wrap the tape measure around their body without making unnecessary physical contact.
3. Measure and record Thigh Circumference around the larger thigh 3" (7.5cm) below the groin. Ask the User to assist by having them holding the end of the tape measure on the front of their thigh so you can pass it through their legs without making unnecessary physical contact.



Measuring Chest Circumference (left) and Thigh Circumference (right).

4. Measure and record the distance from the bottom of the right buttock (gluteal fold), up and across the back, over the left shoulder to the bottom of the left collarbone (clavicle). Ask the

User to assist by having them holding the zero (0) mark of the tape measure at the bottom of their right buttock to avoid making unnecessary physical contact.



5. Using the measurements, and visual observation of the User's body shape and size, record measurements and identify needed Apex component sizes using the Size Chart found on p. 26.
6. Answer any User questions once the measurements, sizing and fitting are complete
7. To set expectations, inform the User of the next steps and the schedule for Apex exosuit delivery and User training
8. Repeat these steps with all Users who will be wearing an Apex exosuit until everyone has been fit, all measurements are documented, and all components and sizes are selected.

## 15 Important Safety Information

### 15.1 Staff Selection

- Inappropriate staff selection may result in personal injury or Apex exosuit damage.
- It is critical for safety that Apex exosuits are used by appropriate staff for jobs that meet all criteria for intended use.
- All staff should receive training on any and all hazards, protective strategies, and personal protective equipment (PPE).

#### Apex Specialists

- At least one Apex Specialist should be trained and certified by HeroWear at locations where Apex exosuits are in use.
- Apex Specialist training consists of User training as well as more advanced Apex exosuit-related tasks for which they are responsible. These include, but are not limited to, fitting

new Users for Apex exosuits; adjusting Apex exosuits for Users; and providing Apex exosuit training to new Users.

## Users

- Users should be selected based on their performance of work that can benefit from the intended use of the Apex exosuits.

## 15.2 Medical Clearance

Medical clearance should be obtained by Users with the following conditions prior to using the Apex exosuit, or if any of the below occur after beginning use:

- The presence of implanted devices such as, but not limited to, cardioverter defibrillators, cardiac pacemakers, coronary stents, insulin pumps, intrathecal drug pumps, artificial hips, artificial knees, spine screws and/or rods, artificial discs, and/or breast implants
- Previous musculoskeletal injuries of the neck, shoulders, back, hips, thighs, or knees
- Previous surgery for musculoskeletal problems of the neck, shoulders, back, hips, thighs, or knees
- Skin diseases, cellulitis, injuries, inflammation, or prominent scars with associated swelling under the areas in contact with the Apex exosuit
- Skin redness or overheating in the areas that are in contact with the Apex exosuit
- Cardiovascular diseases
- Pulmonary diseases
- Renal diseases
- Circulatory disorders of the upper extremities, back, hips or lower extremities, severe varicosis, blood or lymphatic flow disorders, including swelling, inflammation, or edema distal to the body areas on which the Apex exosuit is worn
- Congenital or acquired neurological disorders including upper motor neuron lesions (e.g. Traumatic Brain Injury, Cerebral Palsy, Multiple Sclerosis, Stroke, Spinal Cord Injury, Parkinson's Disease, Amyotrophic Lateral Sclerosis, etc.), or lower motor neuron lesions (e.g. crush injuries, Amyotrophic Lateral Sclerosis, Guillain-Barre Syndrome, Polio, Cauda Equina Syndrome); peripheral neuropathy caused by Diabetes, infections, tumors, bone marrow disorders; inherited disorders such as Charcot-Marie-Tooth Disease, autoimmune diseases such as Sjogren's Syndrome, Lupus, Rheumatoid Arthritis, Vasculitis, Chronic Inflammatory Demyelinating Polyneuropathy; or neuropathies caused by Alcoholism, exposure to poison, certain medications, or vitamin deficiencies causing motor and/or sensory disorders

# 16 Hazards and Protective Strategies

## 16.1 Hazards to Users

### 1. Unguarded Moving Parts

- a. **Switch** – potential pinch point

#### PROTECTIVE STRATEGIES

---

- Keep fingers clear of the space between the upper and lower portions of the Switch when pulling it down into On (engaged) mode.

- Keep fingers clear of the top of the Switch when pressing the button to disengage the Apex.

---

PERSONAL PROTECTIVE EQUIPMENT (PPE):

---

- Gloves

b. **Clutch** – potential pinch point

---

PROTECTIVE STRATEGY:

---

- Keep fingers clear of the bottom of the Clutch where the rope enters and exits the housing.

---

PPE:

---

- Gloves

c. **When removing/installing Switch** – Potential pinch point, puncture, or moving object

---

PROTECTIVE STRATEGIES:

---

- Ensure that Back is on a flat surface before disassembly.
- Ensure Switch is in OFF (disengaged) mode before disassembly.
- Ensure Cable is not under extreme tension at time of Switch disassembly.
- Keep body parts clear of the space between the Switch and cable conduit when removing and installing the Switch to avoid pinch or snag issues.
- Follow all instructions in the assembly section carefully
- Once Switch is removed, be mindful of not letting the cable/Switch to swing uncontrolled in the air

---

PERSONAL PROTECTIVE EQUIPMENT (PPE):

---

- Gloves
- Eye protection or safety glasses

d. **Clips (all plastic and metal)** – Potential pinch or catch points

---

PROTECTIVE STRATEGIES:

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- Avoid getting caught or pinched in the clips when connecting components.

---

PERSONAL PROTECTIVE EQUIPMENT (PPE):

---

- Gloves

2. **Parts with Rough Surfaces**

a. **Rope** – Burns caused by rope exiting the bottom of the Clutch housing

---

PROTECTIVE STRATEGIES:

---

- Keep fingers and hands clear of the rope entering and exiting the bottom of the Clutch housing.

---

PPE:

---

- Gloves
- Eye protection or safety glasses

3. **Parts with Sharp Edges**

a. **Switch Cable** – Potential sharp hazard or flying cable hazard from end of exposed cable when Switch removed

---

**PROTECTIVE STRATEGIES:**

---

- Keep fingers and hands clear of the rope entering and exiting the bottom of the Clutch housing.

**PPE:**

---

- Gloves
- Eye protection or safety glasses

#### **4. Snag, Catch, or Drag Points**

- a. The Apex and its components can snag on objects, work pieces, clothing, or body parts.

---

**PROTECTIVE STRATEGIES:**

---

- Always wear a properly fitted and adjusted Apex exosuit.
- Use Webbing Keepers to manage loose webbing.
- Be mindful of proximity to body parts (e.g. fingers, hair, etc.), or stationary or moving objects to avoid snags.
- Be mindful of the cable running from the Switch, over the left Shoulder Strap and down to the Clutch housing to avoid accidental snags on stationary or moving objects.
- Ensure the Cable is captured by the hook and loop fastener on the left Shoulder Strap.

**PPE:**

---

- A protective garment or cover can be worn over the Apex or the body if needed.

#### **5. Slips, Trips, and Falls**

- a. Personal injuries – User slips, trips, or falls while walking, running, climbing, working at heights, or otherwise moving in the Apex exosuit

---

**PROTECTIVE STRATEGIES**

---

- Eliminate all slip and trip hazards in the workplace.
- Use non-slip floor coverings.
- Provide warning signs for any residual slip or trip hazards.
- Cordon off edges of areas where fall risk exists.
- Practice walking, running, climbing and moving in the Apex in a safe environment before using it in the workplace.

**PPE:**

---

- Wear slip-resistant footwear.
- Use fall protection equipment when working at heights.

#### **6. Radiation or Hazardous Substances Used in the Workplace**

- a. Harm to User or exosuit – interaction between radiation, hazardous matter, or substances that come in contact with the Apex exosuit

---

**PROTECTIVE STRATEGIES:**

---

- Exhaust or remove hazardous matter or substances at their point of release.
- Ensure adequate ventilation.
- Remove the Apex exosuit immediately if it comes in contact with hazardous matter or substances.



- Ensure access to medical professionals in the event of an emergency.

**PPE:**

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- Wear protective clothing or cover over the Apex exosuit that allows for access to the Switch.

## 7. Fire

- Interaction with fire — product damage and/or harm to the User

**PROTECTIVE STRATEGIES:**

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- Pay attention to sources of ignition and eliminate them if possible.
- Mark fire hazards in the workplace.
- Follow all company, local or federal regulations.
- Ensure there is access to medical professionals in the event of an emergency.
- Remove the Apex immediately if it comes in contact with fire.

**PPE:**

---

- Fire resistant or fireproof cover and/or clothing

## 8. Contact with Heat Sources Other than Fire

- Risk of burn injury and/or Apex exosuit damage may occur if Users come in contact with heat sources.

**PROTECTIVE STRATEGIES:**

---

- Keep the Apex exosuit away from all heat sources.

**PPE:**

---

- N/A

## 9. Viruses, Bacteria, Mold, Fungi or Other Hazardous Biological Agents

- Biological agents – viruses, bacteria, mold, fungi, or other hazardous biological agents which can harm Users

**PROTECTIVE STRATEGIES:**

---

- Clean and sanitize the Apex exosuit regularly.
- Wear clothing under the Apex exosuit.
- Store the Apex exosuit properly.
- Ensure good ventilation around the Apex exosuit when storing.
- Wash hands regularly with soap and water.

**PPE:**

---

- Protective clothing under the Apex exosuit

## 10. Contact with Hot or Cold Media

- Extreme temperature contact — Product failure and/or harm to the User if the Apex exosuit comes in contact with hot or cold surfaces or media

**PROTECTIVE STRATEGIES:**

---

- Insulate the Apex exosuit against heat or cold.

- Avoid contact with hot or cold media and exercise caution when working in hot or cold environments.
- Ensure access to medical professionals in the event of an emergency.

**PPE:**

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- Protective cover or clothing worn over the Apex

## 11. Heat-related Illness

- Heat exhaustion or heat stroke — Increase the symptoms for Users working in hot environments

**PROTECTIVE STRATEGIES:**

---

- Take frequent breaks in a cool shaded area or air conditioning and get out of the hot environment often enough to avoid overheating.
- Stay properly hydrated.
- Reduce Apex exosuit wear time in hot environments.
- Ensure there is access to medical professionals in the event of an emergency.

**PPE:**

---

- None

## 12. Poor Weather Conditions While Working Outside

- Product damage — Damage or excessive wear and tear due to poor weather conditions

**PROTECTIVE STRATEGIES:**

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- Avoid working with the Apex exosuit in poor weather conditions.

**PPE:**

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- Wear rain, cold, or foul weather gear over the Apex exosuit.

## 13. Incompatibility with the workplace and/or PPE

- PPE incompatibility — failure of PPE to protect Users

**PROTECTIVE STRATEGIES:**

---

- Ensure the Apex exosuit is compatible with the workplace, environment, equipment and tools used by each worker.
- Test the Apex exosuit with all required and optional PPE to ensure compatibility.
- Avoid use of the Apex exosuit if it is not compatible with the workplace, environment, equipment, tools and/or required PPE.

**PPE**

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- N/A

## 14. Allergic Reaction

- Allergic reaction — User reaction or response to certain materials used in Apex construction

---

PROTECTIVE STRATEGIES:

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- Review Apex's materials to ensure they will not cause allergic reactions.
- Do not use the Apex exosuit if allergic to materials.
- Always wear the Apex exosuit over clothing.
- Avoid physical contact with materials that might cause an allergic reaction.
- Ensure there is access to medical professionals in the event of an emergency

PPE

---

- Gloves
- Protective clothing

## 15. Carcinogens

- a. California Proposition 65 exposure — contact with some of the materials and substances in the exosuit containing chemicals known in the state of California to cause cancer. [For more information, please see the HeroWear Support page.](#)

---

PROTECTIVE STRATEGIES:

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- N/A

PPE:

---

- N/A

## 16. Mental Stress

- a. Mental stress — challenges in wearing or using the Apex in the working environment

---

PROTECTIVE STRATEGIES:

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- Conduct training and information events on the subject of exosuits and their benefits.
- Create opportunities for User communication with management about the User of exosuits.
- Make the use of the exosuit optional (where not required as PPE).
- Conduct User trials before introducing exosuits on a large scale.

PPE:

---

- N/A

## 17. Physical Stress Caused by the Apex exosuit

- a. User injury — forces on the skin and body as a result of wearing the Apex exosuit, or an exosuit malfunction, can cause harm to Users

---

PROTECTIVE STRATEGIES:

---

- Wear clothing under the Apex exosuit.
- Use the Apex only when other ergonomic equipment such as lifting, handling, and transport devices cannot be used.
- Do not use the Apex to extend the duration of time Users spend working without sufficient breaks.
- Provide training for safe use of the Apex exosuit.
- Reduce the number or weight of loads to be handled.
- Adjust the Apex exosuit properly to ensure fit is not too tight which can cause rubbing on the skin, or put stress on the body.

- Complete full inspection before and after using the Apex as described in Inspection, Storage, Care and Maintenance

PPE

---

- None

## 18. Working in an Awkward Position

- User injury — working in awkward postures is inherently risky despite using the Apex exosuit.

PROTECTIVE STRATEGIES:

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- Do not use the Apex to extend work for longer than normal durations.
- Place tools, equipment and objects close by so they are easy to reach.
- Adjust the Apex exosuit properly to prevent it from loosening, slipping, or shifting on the body while in use.
- Fit each worker individually with the Apex exosuit.

PPE:

---

- None

## 19. Poorly Fit and/or Adjusted Apex exosuit

- User harm or injury — risk from poorly fit and/or adjusted Apex exosuits resulting in their failure to work as intended

PROTECTIVE STRATEGIES:

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- Fit each worker individually with the Apex exosuit.
- Adjust the Apex exosuit properly.
- Pause work occasionally to allow Users to verify comfort and fit.

PPE:

---

- None

## 20. Inadequate Training for Use of the Apex exosuit

- User harm or injury — from human error or unsafe use of the Apex exosuit

PROTECTIVE STRATEGIES:

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- Provide training to all Apex exosuit Users by qualified staff and/or Apex Specialists.
- Ensure Users don't develop a false sense of security while using the exosuit.
- Provide ergonomics and body mechanics training to ensure Users engage in the safest-possible movement patterns, postures, and ergonomic best practices.

PPE:

---

- None

## 21. Obstruction of Senses

- User harm or injury — from obstructed senses as a result of using the Apex exosuit

---

**PROTECTIVE STRATEGIES:**

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- Be mindful of sensory limitations and changes as a result of wearing the Apex exosuit.
- Be mindful that tactile sensation may be diminished on the body areas where the Apex exosuit is worn; Users may not be able to experience touch or pressure as they normally do on the skin underneath the Apex exosuit.
- Be mindful of noise emitted by the Apex exosuit.

**PPE:**

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- Follow company guidelines for hearing protection specific to the job being performed.

## **22. Emergencies and Evacuations**

- a. User Impediment — from added complexity in movement in the event of an emergency or evacuation

---

**PROTECTIVE STRATEGIES:**

---

- Practice removing the Apex during emergency and/or evacuation drills.
- Take off the Apex exosuit in the event of an emergency or evacuation.
- Switch the Apex to OFF (disengaged) to move more freely if unable to remove in the event of an emergency and/or evacuation,
- Practice working around and/or removing the Apex from casualties/victims during emergency and/or evacuation drills.
- First Responders only — Proper training and practice drills are recommended for using the Apex exosuit for bending and/or lifting during an emergency.

**PPE:**

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- None

## **23. Exosuit Malfunction**

- a. Product malfunction – from failure of Apex components and parts

---

**PROTECTIVE STRATEGIES:**

---

- Inspect the Apex exosuit for broken, cracked, defective or worn out parts before and after each use.
- Instruct Users to doff the Apex exosuit and inspect it at the first sign of a potential problem.
- Remove any Apex exosuits with broken, cracked, defective or worn out parts from service.

**PPE:**

---

- None

# **17 Additional User Safety Considerations**

## **17.1 Reuse on Other People**

Injury or Apex exosuit damage may occur when devices are reused by and/or reassigned to people for whom the device was not fit and adjusted for.

It is recommended that Apex exosuits be used by one person only.

## 17.2 **Improper Cleaning, Sanitization, Disinfection and/or Decontamination**

Skin irritation, inflammation, and certain forms of eczema and/or infections due to contamination may occur if Apex exosuits are not properly cleaned, sanitized, disinfected and/or decontaminated.

This applies to Apex exosuit used by only one person as well as those that might be reused by other people, or shared amongst a group of Users.

## 17.3 **Direct Contact With Users' Skin**

Skin irritation may occur with direct or in some cases indirect (over clothing) contact with skin.

Do not continue to use the Apex exosuit if skin irritation occurs.

## 17.4 **Contact With Heat Sources Such as but Not Limited to Fire**

Risk of burn injury and/or Apex exosuit damage may occur if Users come in contact with heat sources.

Keep the Apex exosuit away from all heat sources.

# 18 **Additional Product Safety Considerations**

## 18.1 **Excessive Strain on the Apex Exosuit**

Injury or Apex exosuit damage due to changes in or loss of functionality can occur when the device is exposed to excessive strain.

Only use the Apex exosuit as it is intended to be used.

If the Apex exosuit has been exposed to extreme strain, including but not limited to a fall, on the mechanical components, or a snag resulting in forceful shock to the device, inspect the exosuit and if needed, remove it from use for repair, replacement, or return to HeroWear.

## 18.2 **Contact With Salt Water, Chlorinated Water, or Dirty Water**

Damage or premature wear and tear may occur when the Apex exosuit is in contact with salt water, chlorinated water, or dirty/otherwise contaminated water.

- Promptly clean, sanitize, disinfect and/or decontaminate the Apex exosuit thoroughly after contact with salt water, chlorinated water, or dirty/otherwise contaminated water.
- Allow the Apex to dry thoroughly after contact with salt water, chlorinated water, or dirty water and subsequent cleaning, sanitizing, disinfection and/or decontamination.
- Waterless ozone cabinet disinfection and/or decontamination is recommended for all Apex exosuits that come in contact with dirty or otherwise contaminated water.

## 18.3 **Contact With Clean Water**

Damage or premature wear and tear may occur when the Apex exosuit is used in wet weather, or

when it is splashed, sprayed, and/or soaked with water.

- Allow the product to dry thoroughly after contact with clean water

#### 18.4 **Contact With Abrasive Substances and/or Materials Such as but Not Limited to Dust, Sand, Dirt, or Mud**

Damage or premature wear and tear may occur when the Apex exosuit is in contact with abrasive substances and/or materials such as but not limited to dust, sand, dirt, or mud.

- Promptly clean, sanitize, disinfect and/or decontaminate the Apex exosuit thoroughly after contact with abrasive substances and/or materials such as but not limited to dust, sand, dirt, or mud.
- Allow the product to dry thoroughly after contact with abrasive substances and/or materials such as but not limited to dust, sand, dirt, or mud and subsequent cleaning, sanitizing, disinfection and/or decontamination.
- Perform a function check after cleaning to ensure that the Clutch, Clips and other mechanical components operate as intended.

#### 18.5 **Exposure of Apex Exosuits to Unsuitable Environmental Conditions**

Damage or premature wear and tear may occur when the Apex exosuit is in contact with unsuitable environmental conditions.

- Store Apex exosuits according to the recommended storage methods and environmental conditioning.
- Avoid contact with wet, abrasive or other substances which are not included in the Apex exosuits' intended use.
- Do not expose Apex exosuits to temperatures below -20 degrees Celsius (-4 degrees Fahrenheit) or above 50 degrees Celsius (122 degrees Fahrenheit), in conditions such as but not limited to extremely hot and sunny environments (e.g. deserts), drying on heat sources (e.g. radiators), or extremely cold environments (e.g. arctic).

#### 18.6 **Use With Personal Protective Equipment (PPE)**

Apex exosuits can be worn with typical PPE including but not limited to hard hats, safety glasses, hearing protection, gloves, knee pads, safety shoes/boots, and fall protection harnesses.

##### **Fall Protection Harness Considerations**

- Apex exosuits are compatible with many common fall protection harnesses.
- In the event that a fall protection harness must be worn with an Apex exosuit, it should be worn over the Apex exosuit.
- Prior to first use, safety tests (drop testing) with the fall protection harness and Apex exosuit worn together should be performed by qualified experts. Do so before working at heights to ensure that both the fall protection harness and Apex exosuit work properly together.
- In the event a fall protection harness and Apex exosuit do not work well together, fail safety tests (drop testing), and/or there is evidence that either piece of equipment will not work properly or fail when used in conjunction with the other, they should not be used together.

# 19 Technical Information

## 19.1 Weights & Dimensions

Weights and dimensions may vary due to changes in design and manufacturing. Please refer to the HeroWear Support page - <http://www.HeroWearExo.com/HeroCare360> - for the most up-to-date weights and dimensions.

## 19.2 Product Noise Emission

- 69.8 dB(A) max to engage Switch
- 79.7 dB(A) max to disengage Switch
- 62.6 dB(A) max while moving (bending and squatting) in engaged mode
- 56.7 dB(A) max while moving (bending and squatting) in disengaged mode
- 64.2 dB(A) max unclipping chest strap
- 90.9 dB(A) max clipping chest strap
- 71.8 dB(A) max taking off / separating Thigh Sleeves' hook and loop fastener

Noise Measurement Method: NIOSH Sound Level Meter on iPhone XR measured one (1) inch away from the external auditory meatus of the tester's left ear

Hearing protection is not required unless otherwise required due to noise levels in the environment where the Apex exosuit will be used. Refer to company, agency or institution policies for hearing protection.

## 19.3 Environmental Conditions for Intended Use

- Operating Temperature Range: -20 degrees Celsius (-4 degrees Fahrenheit) to 50 degrees Celsius (122 degrees Fahrenheit).
- Storage Temperature Range: -20 degrees Celsius (-4 degrees Fahrenheit) to 50 degrees Celsius (122 degrees Fahrenheit).
- Before using the Apex exosuit, a qualified expert should perform an evaluation to ensure there are no hazards or risks that could pose a danger to Users.
- The Apex exosuit is intended to be used in the following environments:
  - Indoor controlled climates
  - Outdoors, day or night, sunny, dry, overcast and/or windy
- The Apex exosuit should not be used in unsuitable working environments.
- The Apex exosuit is not intended to be used in the following environmental conditions:
  - Explosive
  - Abrasive (e.g. dust, sand, dirt, mud)
  - Corrosive and/or caustic (e.g. chemicals)
  - Toxic and/or contaminated (e.g. chemicals, biohazards, radiation)
  - Wet (e.g. outdoor precipitation)

