



User Guide

KINOVA[®]
Dynamic
arm support 0540

KINOVA
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What is an arm support?

This section describes the concept of an arm support.

A dynamic arm support is an assistive technology product which allows people with limited arm and shoulder function to move their arms and hands more freely. This facilitates many kinds of daily activities, such as using a computer or eating. Arm supports use mechanisms to compensate for the weight of the user's arm. Without having to expend energy to hold up the weight of the arm, people with limited function can then use what upper body strength they have to move their arm more easily. This can help maintain the muscles, joints and cognitive functions of the user.

Use of arm support and normal use definition

This section describes the normal use of the arm support.

The arm support device does not take over any arm function. The user makes the movements himself, using his own upper body arm strength. The device only supports part of the weight of the arm, making it easier to perform the movement. The device supports the arm through all movements within a 3D region. Actions performed while using the arm support are the responsibility of the user.

Limitations: The arm support is intended to be used to help support arm movements during typical, everyday activities at home, in public, or in a typical office environment. The arm support is **not** intended to be used while driving an automobile or operating other heavy equipment.

Symbols used in this guide

This section describes the meaning of symbols used in the guide.

The following symbols are used in this manual:



Specialized disposal guidelines.



Pinch point.



Warning / Caution

KINOVA® *Dynamic arm support 0540* specifications

This section describes the specifications of the KINOVA® *Dynamic arm support 0540*.













Specifications:

- Weight: 6600 g (14.5 lb)
- Weight compensation range: 600 g to 2300g g (1.3 lb to 5.0 lb)
- Housing size in upwards position (W x D x H): 17 cm x 10 cm x 85 cm
- Housing material: die cast aluminum and ABS plastic

Arm support safety



This section describes safety recommendations for use of the arm support.

-  The arm support works with a spring compensation mechanism. The tension in the springs provides the force for compensation. When the upper arm of the arm support is lowered, there will be tension on the springs. This tension will cause the support to spring upwards when you release the arm from the support. When removing the arm from the support, do so slowly and carefully and hold the upper arm of the support so that it doesn't spring up too suddenly.
-  When the arm support is in a locked position, make sure your arm is placed properly in the brace, with weight applied on the support, before releasing the brake or moving the arm support out of its locked position.
-  Hitting one of the compensation adjustment buttons while the Horizontal / Vertical (H / V) brake is activated will cause the brake to disengage. Only adjust compensation when your arm is in the brace.
- When the arm support isn't used, always bring the upper arm segment of the arm support back into its most upwards position so that there is no tension on the springs.
- Each day before using the arm support, it is recommended to give the arm support a quick check over to confirm that the brace is firmly attached and mechanisms are secure to hold up your arm.
- The physical controller for the arm support provides the most reliable means of control. When wireless control with an Android app is used, make sure to keep the physical controller connected as a backup.
-  The arm support may only be used for the intended purpose. Any type of use which is not specified in this manual will be considered as improper use. The customer is solely responsible for material damage and injury of persons resulting from improper use.
-  Assembly, commissioning and maintenance should only be carried out by trained specialists.
-  Under no circumstance should you open the housing of the arm support. The warranty is void in such a case.
-  Do not use the arm support in environments exposed to corrosion hazards.
-  Do not immerse the arm support in liquid or use in heavy rain or snow. Do not wet controller. When cleaning the outside of the arm support, a moistened towel shall be used.
-  Protect the arm support against sand, vapours and dust. Do not use in sandy or dusty environments. Remove the arm support during haircuts as the small hairs can get into the support mechanisms. This can impair performance and reduce safety.
-  Be aware of finger pinching. There are potential pinch zones indicated on the support in two locations (identified on the support with stickers):
 1. Hip joint

2. Shoulder joint

Never stick your fingers in any cavity of the product. Make sure people around you, particularly children, do not put their fingers near pinch points.



-  Do not activate horizontal/vertical brake when product is not used.
-  Do not use product if damaged.

Arm support warranty

This section describes conditions related to the warranty.

Warranty claims shall be voided if:

- Conditions specified in the user manual are ignored.
- The appliance is used outside the normal use definition.
- Any part of the appliance is modified or opened.
- The appliance is improperly set up or incorrectly electrically connected.

The warranty does not cover cable breakage or damage to the printed circuit board (PCB) due to incorrect use.

KINOVA® Dynamic arm support 0540 components

This section describes the main components of the KINOVA® Dynamic arm support 0540.



The dynamic arm support consists of the following main components:

- Rotation frame - the frame at the bottom mounting point on which the arm support rotates around a vertical axis
- Main axle - the vertical rotational axle
- Hip joint - the middle rotational point (close to the hip)
- Shoulder joint - the uppermost rotation axis
- Upper arm - the connection between the shoulder joint and the brace mounting point
- Brace mounting point - where the brace is connected
- Brace - where the arm rests while the arm support is in use (not shown)

KINOVA® Dynamic arm support O540 functionalities and controls

This section describes the functionalities and controls of the KINOVA® Dynamic arm support O540.

The following functionalities are available for the Dynamic arm support O540:







- Compensation force
- Tilt (forward and backward)
- Horizontal / vertical (H / V) brake
- Rotation brake

The arm support comes with a controller to adjust these settings electronically. The controller has six buttons. With the controller you can activate the different functions.



The buttons are especially designed for people with little strength.

The six button control setup is as follows:

-  : more compensation
-  : less compensation
-  : tilt function forward
-  : tilt function backward
-  : rotation brake
-  : horizontal/vertical brake



Note: Do not activate multiple controls at once or rapidly click the buttons. This may cause improper functioning of the arm support.



Be careful not to accidentally activate one or multiple buttons on the controller. This could unintentionally activate arm support functionalities.

Adjusting the compensation force

This section describes how to adjust the compensation force on the *Dynamic arm support 0540*.

You can adjust the level of compensation (force) of the arm support steplessly, to compensate for various arm weights. This can be done by pushing the  and  buttons. It is possible to hold down the buttons to keep changing the compensation.

When the arm support is connected to the power supply and used for the first time, you need to hold down one of the compensation buttons for at least 5 seconds. This will make an initial connection. After this, the functions will react without delay as soon as the button is pressed. This has to be repeated every time the arm support is disconnected from the power supply.



When the the compensation level reaches the minimum or maximum compensation point, the compensation motor will emit an auditory signal indicating that a limit has been reached. It is not possible to compensate beyond this point, so the button can be released.

Adjusting the tilt

This section describes how to adjust the tilt of the *Dynamic arm support O540*.

With the tilt function you can tilt the base of the arm support forward and backward. The tilt function has three functions:

1. Enlarge the working range forward and backward.
2. Make it easier for the user to reach forward or pull the arm backward (toward the mouth).
3. Keep the arm support in a perfect vertical position when the wheelchair is on an incline.


The tilt function can be activated by pushing the  (forward tilt) or  (backward tilt) button. It is possible to hold down the buttons to continuously increase or decrease the tilt up to the minimum or maximum limits.


When the tilt reaches the minimum or maximum tilting point, you will hear a beep. It is not possible to tilt any further, so the button can be released.


Horizontal / vertical brake


This section describes the function of the horizontal / vertical brake of the *Dynamic arm support 0540*.


The horizontal/vertical (H / V) brake makes it possible to lock the vertical and horizontal movements. When applied, only rotational movement around the main axle is available.

The H / V brake is activated by pressing the  button once. After pressing this button, immediately (within 2 seconds) move the arm a bit in any direction to engage the brake mechanism. You will know the H/V brake is engaged when you hear a click. It will then be impossible to move the arm.

To disengage the H / V brake, hold the  button down for 2 seconds.

If for some reason the H/V lock isn't engaged within 2 seconds, the H/V lock will deactivate. You will need to push the  button again to reactivate.


 The H / V brake is designed to hold a maximum force of 4.5 kg. If a larger force is applied, the H / V brake will disengage automatically. This is a safety feature to prevent you from injuring your arm when running into an obstacle, for example, a door frame, while driving the wheelchair. Once the H / V brake has been disengaged in this matter, it is necessary to hold the button down for 2 seconds first, before being able to engage it again.


 When driving the wheelchair, ensure that the arm is in the brace and the H / V brake activated to avoid unintended arm movement.


Rotation brake

This section describes the rotation brake of the *Dynamic arm support O540*.

The rotation brake makes it possible to lock the rotational movement of the main axle of the arm support. When applied, only horizontal and vertical movement is available.

The rotation brake is activated by briefly pressing the  button once.

To disengage the rotation brake, briefly press the  button once.

 The rotation brake is designed to provide resistance to hold the user's arm in place in normal use. If a large enough force is applied, however, the rotation brake will slip. This is a safety feature to prevent you from injuring your arm when running into an obstacle, for example, a door frame, while driving the wheelchair. Please inform your caregivers should this occur.

Wireless control via Android phone app and Bluetooth (optional)

This section describes wireless control of the arm support over Bluetooth using an Android phone app.

Overview

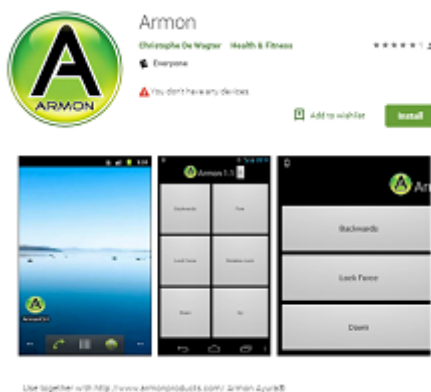
The KINOVA® *Dynamic arm support O540* can also be controlled wirelessly using an Android app. The app connects over Bluetooth to the arm support and allows users access to the same controls as the physical wired controller, but using touch screen controls on the Android device.

Note: When the app is connected to the arm support, the physical controller will still be available and active.

Note: Only one Android device can connect to the arm support using the app at a time.

The app, titled "Armon," can be downloaded onto an Android device in the Google Play marketplace.

Note: The app is compatible with the *Dynamic arm support O540*, but is not designed or provided by Kinova.



Pairing the Android device with the arm support

Before using the app with the arm support, you will need to first pair the Android device with the arm support. This will only need to be done once; after that the Android device will remember the connection details. To pair the device to the arm support, make sure that the arm support is connected to electrical power, and then do the following:

Note: The precise details of some steps carried out on the Android device may vary from device to device and between different versions of Android. Consult the documentation for your device and for Android if you need guidance on how to carry out these steps.

1. Turn on Bluetooth on the Android device. Make sure the device is within range of the arm support (within a few meters).
2. Look for the arm support ID in the list of available Bluetooth devices. The ID will depend on the particular arm support, but will be in the format "KIN_abcd", where abcd is a four digit number.
3. Select the arm support to try to pair the device to the arm support.
4. You will be prompted for a PIN code. Use 2766. The device will then attempt to pair with the arm support. You should receive a confirmation within a few seconds if the process was successful. If not, try again.

Connecting with the app

To connect to the arm support with the app:

1. Open the app on your device by tapping the Armon app icon.
2. If the Bluetooth is not turned on, you will be prompted to allow Bluetooth to be enabled.
3. You will be presented with a list of IDs for any arm supports to which you have paired before. Select the appropriate arm support from the list to connect and enable wireless control.

For more information on this app, contact your Kinova distributor.

Arm support cleaning

This section describes guidelines for cleaning of the arm support.

When cleaning the outer parts of the arm support, the brace and controls can be cleaned with a soft, clean cloth dampened with lukewarm water and a non-abrasive liquid household cleaner.

Note: When cleaning the outer part of the arm support, do not use any detergents, acid solutions, abrasive or aggressive solutions or inflammable substances.

Note: Use of any of the above mentioned substances or improper use of the accessories will cause irreparable damage to the equipment and the warranty will no longer be valid. Do not spray or pour liquid on the external parts of the equipment, or into the holes on the casing, as this may damage the electronics inside.

Note: Do not immerse the unit in liquid.

Note: The unit must under no circumstances be opened or dismantled in order to clean or check inner parts. The arm support does not require cleaning of inner parts and in all cases, only specialized technicians should carry out such operations. Opening the outer case may void the warranty.

Support

This section describes contact information for product support.

For support, contact Kinova via the website support page:

<https://www.kinovarobotics.com/support>

Product end of life - servicing and disposal

This section describes what to do at the end of the normal life of the product, giving instructions for servicing or disposal.

By design, the arm support device is expected to have a normal lifetime of 5 years.

At the end of this period, there are two options:

- Continue using the device
- Replace the device and dispose appropriately of the old device

If you wish to continue to use the arm support after the normal life span of the product has passed, Kinova highly recommends that you return the device temporarily to Kinova for routine servicing. Kinova will inspect the device and can replace / repair any internal components that may have worn out.

For more details, contact Kinova using the website support page:

<https://www.kinovarobotics.com/support>



If you wish to dispose of the device, note that the device contains materials that can be recycled and/or are noxious to the environment. Specialized companies can dismantle the unit and sort out these materials. When you dispose of the unit, find out about local regulations concerning waste management.

There is no need too small.
No task too great.

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