

**karma**

*User manual*

***Leon F Kameleon***



A Better Wheelchair, A Better Fit



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## 2. How to contact Karma

### Head office Karma

# Karma

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Produced and published by Karma Medical, Taiwan  
Technical changes and print errors prohibited.

### 3. Declaration of conformity

**karma**

## Declaration of Conformity

As a wheelchair manufacturer, the company:

KARMA MEDICAL PRODUCTS CO., LTD  
No.2363 Sec.2 UNIVERSITY RD., MIN-HSIUNG  
SHIANG, CHIA-YI 621, TAIWAN

And the European representative:

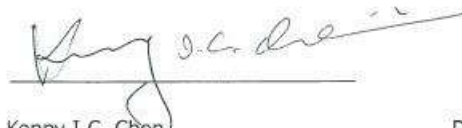
KARMA MOBILITY, S.L.  
C/ PERIODISTA FRANCISCO CARANTOÑA  
DUBERT, 23 Bajo 33209 GIJÓN - ASTURIAS (SPAIN)

declare under his sole responsibility that the wheelchair products:

Power Wheelchairs products Leon F Kameleon Series

have been classified as Class 1 and are manufactured in conformity with the provisions of the Medical Device Directives 93/42/EEC 2007 and 2007/47/EC, and are in conformity with relevant European harmonization standards of EN 12184:2014.

Signature :



Kenny I.C. Chen  
General Manager

Date : 2020  
Feb. 5

## 4. Introduction

Congratulation with your new Karma product! This product has been made with great care and dedication. The Karma product will increase your freedom of mobility and independence. Karma and its resellers all over the world are there to support in any way. So if you have questions or suggestions about our products, do not hesitate to get in contact with us at [globalsales@karma.com.tw](mailto:globalsales@karma.com.tw).

Before you use the Karma product, we strongly recommend you read this manual carefully and always keep it with your product. This way you are always able to find additional information when needed.

Karma runs the policy of continuously product improvement. Therefore, pictures of products or options as shown in this manual might be different from what you see in the product. Karma reserves the right to make changes to the product without prior notice.

### 4.1 Chassis number

The chassis number is very important. Your wheelchair will be stored in our data system under this main number. You can find the number in the front end of the chassis.

<b>Karma Medical Products Co., Ltd.</b>		<b>CE</b>		
2363, Sec. 2 University Rd., Min-Hsiung, Chia-Yi 621, Taiwan				
<b>TYPE</b>	<b>Leon F</b>	<input type="checkbox"/> VRS	<input type="checkbox"/> KML	
<b>V<sup>max.</sup></b>	<input type="checkbox"/> 6 km/h	<input type="checkbox"/> 10 km/h	<input type="checkbox"/> 12 km/h	
	<input type="checkbox"/> 57 kg		<input type="checkbox"/> 136 kg	<input type="checkbox"/> 6°
		<b>SN:</b>	<input type="text"/>	



Chassis serial plate

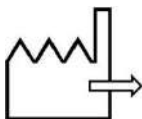
**The used symbols on the chassis plate are explained below:**



describes the model and type of the product.



stands for indoor- and outdoor use (Class B).



stands for the date of production.



this icon stands for the maximum driving speed.



this icon stands for the maximum slope to drive on.



this icon stands for the maximum user weight.

**SN:**

stands for the chassis serial number.

## 5. Used symbols for warning, caution and note

General warnings are indicated by using a symbol. There are three levels of warnings:

### 1. Warning



If you see this sign, please use extreme caution where this symbol appears. Neglecting these warnings can lead to personal or material damage.

### 2. Caution



If you see this symbol, use caution to prevent dangerous situations.

### 3. Note



If you see this symbol, we provide additional information which might be good to know. Please take notice if this information.

- Before using the wheelchair, you should read this manual to get familiar with this product.
- Make sure the local reseller has set up the product in a proper way to exactly fit your needs and requirements.
- Always be accompanied by an attendant person when you drive the wheelchair for the first time.
- The first drive should take place in a safe and wide area so you can get acquainted to your wheelchair without any danger.
- Always start to drive the wheelchair in the lowest possible driving speed first.

## 6. Warranty

Karma Medical supplies a warranty of frame for a period of 5 years and electrical system (controller, motor, charger, actuator and PCB) for a period of 1 year after delivery to the customer. Your local supplier will carry out this warranty. For battery warranty, it is subject to the periods set by the manufacturers. Please contact your local supplier in detail.

For a warranty claim you get in contact with our local authorized Karma reseller or directly with Karma Mobility S.L. Make sure you also provide the chassis serial number of your product.

The warranty does not apply to damage or faults of the product caused by wrong or improper use, or neglected maintenance. The evaluation of it is the privilege of Karma Medical or a representative to be appointed by Karma Medical.

This guarantee does not apply to components susceptible to wear such as bearings, cables, carbon brushes, circuit breakers, covers, footplates, light bulbs, pads, side guards, upholsteries, wheels and similar parts.

Karma Medical reserves the right to alter the specifications at any time. No responsibility can be accepted for any changes in the specifications. Change of specification can be caused by e.g. availability of parts, product improvement based on market experience, changed legislations etc.

Besides, Karma Medical is not responsible for the transportation costs for repair and replacement.

### **WARNING**

The use of non-original parts on this product can lead to personal or material damage. Karma Medical cannot be held responsible for these results.

Repairs executed by unauthorized persons can lead to personal or material damage. Karma Medical cannot be held responsible for these results.

If you have any doubt about the service provided to your wheelchair, please contact Karma Medical Taiwan for information.

## **7. Intended use / intended user**

The Leon F Kameleon powered wheelchair is meant to provide mobility to persons who are not able to walk, stand or use a manual wheelchair, but who are very well able to control and use the interface of a powered wheelchair.

The wheelchair is designed for a maximum user weight of 57 kg.

Apart from the horizontal mobility, the Leon F Kameleon provides the user with mobility in vertical direction. For example, to reach light switches, a doorbell and doorknobs.

It is strongly suggested to have the use of the wheelchair evaluated by a trained doctor, therapist or other qualified and trained staff.

This wheelchair is not suitable for persons who do not have the cognitive skills to drive a powered wheelchair by themselves. Also, it is not suitable for visually impaired persons.

## **8. Intended environment**

The Leon F Kameleon powered wheelchair is not restricted to only indoor or only outdoor use. Because the large driving wheels are placed in the front, the wheelchair is extremely maneuverable and is able to cope with many terrain differences. This, combined with the compact size of the product and the excellent speed range and battery capacity, making the wheelchair suitable for both indoor and outdoor use.

It is allowed to use the wheelchair in different weather conditions. It can be used at temperatures of -25 degrees up to maximum 55 degrees Celsius.

However, it must be noticed that metal or plastic surfaces of the wheelchair can become very hot when exposed to direct sun for longer time.

Because of the harmful combination of saltwater and sand, it is advised not to use the wheelchair on beaches. We advise to clean the wheelchair after having been in contact with sand and/or saltwater as described in the paragraph "cleaning".

## **9. Tyre pressure**

The Leon F Kameleon uses air-filled front tyres and solid or air-filled tyres in the rear. The choice of having solid or air-filled rear tyres is made by the user during the ordering of the wheelchair. In order to prevent tyre damage and to preserve the performance of the wheelchair, the tyre pressure must be checked at least on a monthly basis. The tyre pressure should be:

**Front air-filled tyres (Large): max. 240 Kpa / 35 PSI / 2.4 bar**

**Rear air-filled tyres (Small): max. 350 Kpa / 50 PSI / 3.5 bar**

## 10. Wheelchair

### 10.1. Chassis

The chassis is the base of the wheelchair. It contains wheels, drive motors, batteries and electronics. The steel parts of the chassis are electrolytic anodized and powder coated to ensure a long life without corrosion.



Each of the front wheels is propelled by a powerful drive motor. These motors also take care for the steering of the wheelchair. With this system it is possible to turn on the spot. This makes the wheelchair optimal for indoor use.

#### 10.1.1 Chassis suspension

The chassis has independent suspension on each of the four wheels. The stiffness can be adjusted to your personal requirements.



*Front suspension*

*Rear suspension*



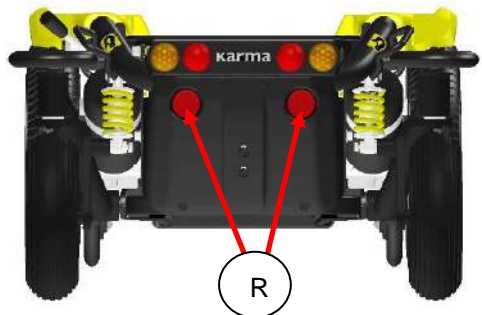
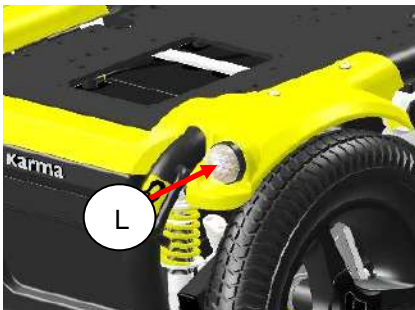
### 10.1.2 Anti-tippers

The anti-tippers prevent the wheelchair tipping over at all time. The anti-tippers are standard equipped and positioned at the front of the chassis.



DO NOT operate the wheelchair without anti-tippers being installed, otherwise the wheelchair might tip over and hurt the user.

### 10.1.3 Lights and reflectors (Optional)



The chassis has very strong and bright LED lights to make sure you can have a safe drive in the dark. The orange reflectors on both sides and the red reflectors in the rear also make you visible for other people as well. The lights fulfill the European requirements.

The additional LED indicators give our environment clear information in which direction you want to go.

### 10.1.4 Battery compartments

The batteries are mounted as low as possible in the center into the chassis, to provide an optimal center point of gravity. This results in a maximum stability of the wheelchair. The compartment can hold maintenance-free batteries up to 80Ah. For the specification of the batteries see the chapter technical specifications.

The maintenance-free batteries can be reached from the front side.



*The front and rear battery box*

The batteries are placed in a box with a handle for easy changing. For more details of changing the batteries, please check the paragraph “battery replacement”.



*Battery box slides out of the chassis*

#### CAUTION

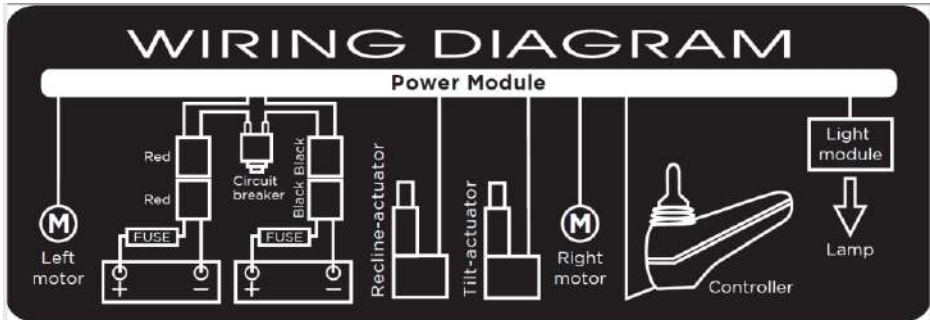
When pulling the battery out of the box do mind to not overstretch the cables. This might lead to technical failure.

**CAUTION**

Before removing the batteries, first remove the main fuse. It helps to reduce the risk of short circuit or electrical shock. See the paragraph “main fuse”.

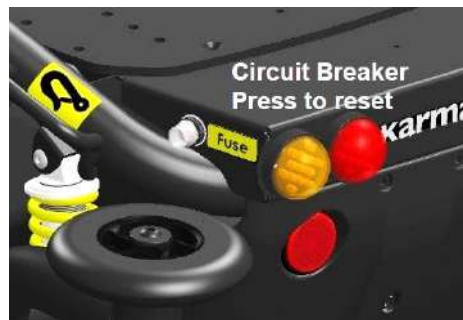
**CAUTION**

Before reconnecting the battery, read the wiring instructions on the inside of the battery cover.



### 10.1.5 Main fuse

The chassis contains a main fuse which is located at the rear of the chassis. The main fuse protects the whole electrical system of the wheelchair. This fuse will only blow if there is a serious problem on the wheelchair.



This situation happens typically when the wheelchair is climbing up a hill that is steeper than what is restricted. Should the circuit breaker pop-up, you need

to eliminate the cause first. And then, press down the circuit breaker. You will be able to drive again.

**⚠ CAUTION**

If the main fuse has blown, do not replace the fuse immediately. First contact your local supplier to have the wheelchair checked.

**⚠ CAUTION**

Only use original main fuses as replacement. Using other fuses might lead to material damage to the wheelchair.

### 10.1.6 Bumper wheels (Optional)

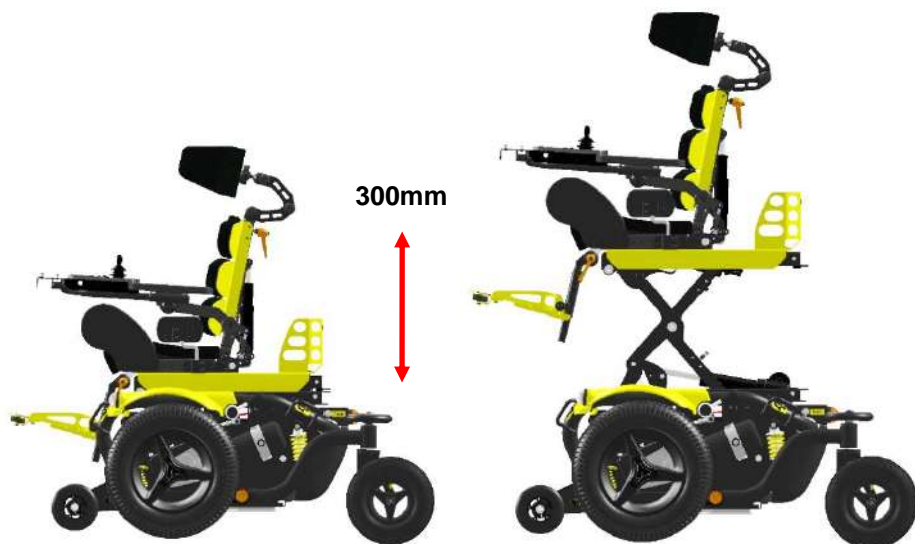
Bumper wheels are available to protect the rear end against damage when bumping into a wall. It protects both the wall and the wheelchair.



*Rear end bumper wheels*

## 10.2 Seat lift (Optional)

The seat lift is centrally mounted into the chassis. With this lift the seat can be raised stepless up to 300mm. This enables the user to have more freedom of movement, not only in horizontal area, but also in the vertical area. The seat lift can be stopped at any height and will be automatically locked in position.



Whilst lifting the seat, the driving speed will always automatically be reduced to gain maximum stability. At high seating position, the seat tilt will also be blocked to gain maximum stability. The seat height can be set to every position by the user.

### CAUTION

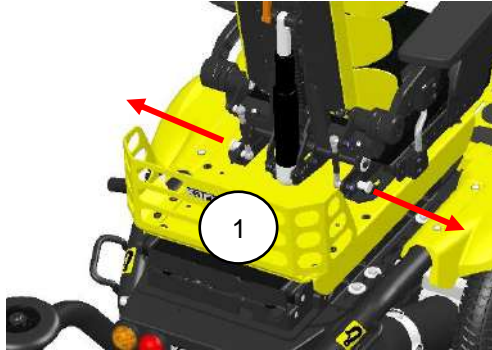
Be careful of driving in high seating position at slopes. We strongly suggest only use the seat lift on flat areas. Lifting high on a steep slope might lead to instability and might cause personal or material damage.

### NOTE

The seat lift can also be very helpful for transferring or lifting the user in or out of the wheelchair.

### 10.3 Quick release seat mounting

With the quick release seat mounting system, the seat can be taken off the chassis easily and fast. The quick release rails can be adjusted forward or backward on the seat base panel to achieve a right center of gravity positioning of the seat on the chassis.



*Quick release locking bolts*

To unlock the seat, pull both locking bolts outwards (1) and pull the seat backwards (2). Then lift the seat up (3), which is followed by the rear first to lift it out of the locking rail.



#### **i** NOTE

When locking the seat back onto the chassis, make sure the locking bolts are in the proper locking position to secure the seat mount.

## 10.4 Seat

The seating system is designed to optimize the seating comfort to the user. It can be adjusted in seat depth and seat width.

The best possible sitting support is accomplished by an individual combination of a wheelchair base and proper seating elements. The modular Kameleon seat allows the adjustment of the seat and backrest angle to each user's specific needs. In addition, the various modular seating elements can be chosen within the Kameleon seat system, depending on the functional limitations of the user. By that the seat can perfectly be assembled for each specific user.

### **Kameleon seat system advantages:**

- It can grow with the user in small steps
- Modular product structure with many options and combinations.

### **User benefits:**

- Optimal seating support
- Good pressure distribution
- Perfect posture
- Grow with the user
- Excellent comfort

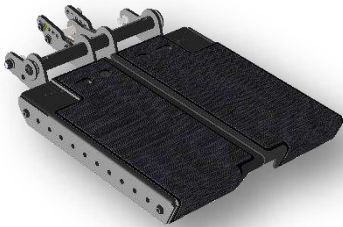
### **The Kameleon seat system includes the following elements:**

- Seat pan with cushions
- Backrests with cushions
- Armrests
- Footrests
- Headrests
- Postural support elements

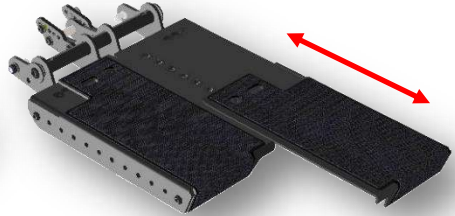


### 10.4.1 Seat pan with cushions

The seat pan is a sheet metal frame which is adjustable in depth, width and shape.

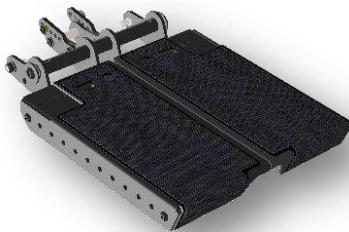


*Seat pan short*

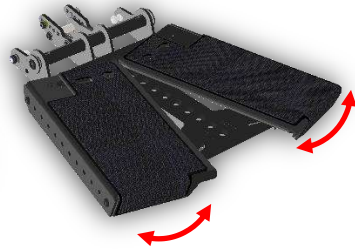


*Seat pan one side extended in depth*

The seat depth can be adjusted left and right side independently in steps of 20mm.



*Seat pan straight*

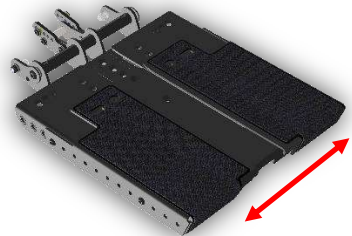


*Seat pan spread setting*

The seat pan can also be put into a spread position where both left and right panels can spread up to an angle of 15 degrees independently.



*Seat pan narrow setting*

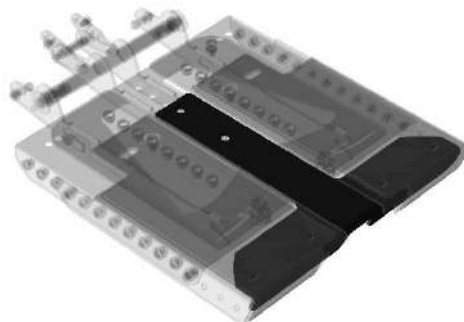


*Seat pan wide setting*

The seat width can be adjusted in 3 steps of 12.5mm each.



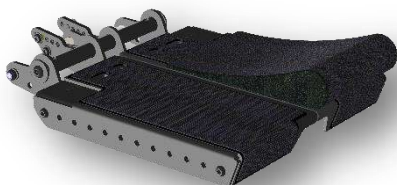
When the seat is set at the widest setting, the gap between both left and right set pan will be filled by the T-panel shown below.



*Seat pan T-panel*

#### **10.4.2 Seat curve foam wedge (Optional)**

The seat can be shaped by adding a hard foam wedge. This wedge has an ergonomic S-shape which gives more contours to the seat. The wedge can also be cut or grinded to reset the shape by therapists or dealers to create a perfect fit and seat support.



*Seat pan with left side added wedge*



*Seat with wedge and cushion*

This add-on wedge gives the user the choice of having a flat seat cushion or ergonomically shaped seat cushion.



#### **NOTE**

The seat pan is also designed to add off-the-shelf cushions if required.

The design of the seat cushions gives you a total freedom in size and shape and can be different in setting between left and right.

### 10.4.3 Seat tilt (Optional)

The seat tilt can be used to release pressure and improve stability. The tilting angle is from 0 to 45°. The tilt can also be used when driving down a slope for compensating the negative seat angle. This provides a more stable seat position and safe driving.



If the tilt is activated over a certain angle, the driving speed will be reduced. This is to reduce the risk of danger whilst driving at high speed.

#### CAUTION

Always drive carefully on slopes. The angle of the slope has great influence on the total stability of the wheelchair.

#### CAUTION

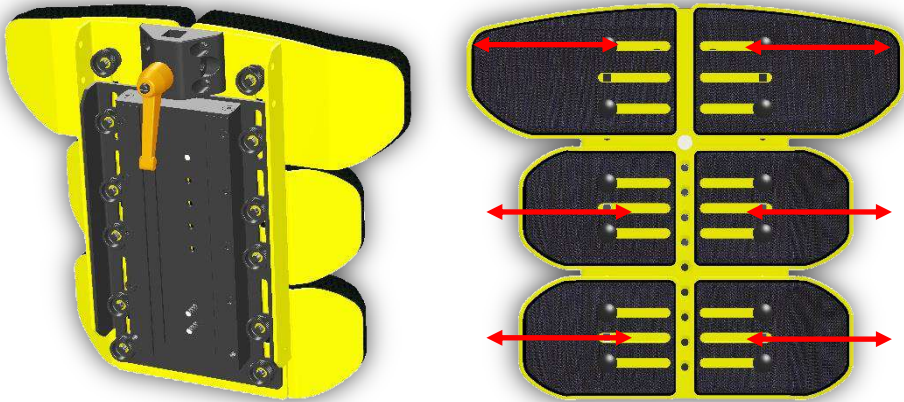
When tilting, it always checks if there is no obstructions close to the wheelchair, especially in the front or rear of the wheelchair.

#### CAUTION

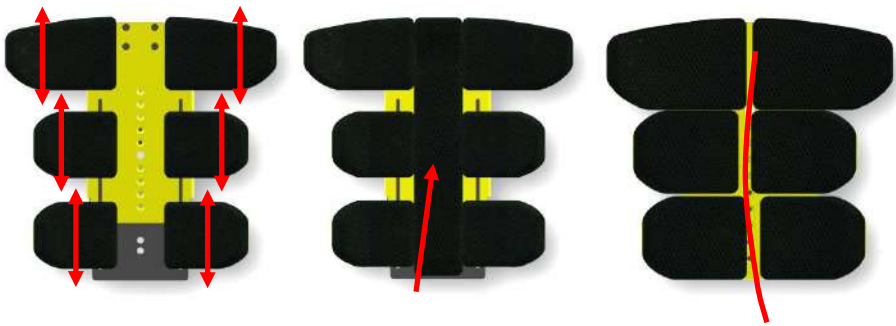
When tilting, the wheelchair will get longer. This has the influence on the driving characteristics of the wheelchair. Make sure there is enough space to drive.

### 10.4.4 Upholstered backrest

The upholstered backrest is set up by different backrest modules which can be set and adjusted to the user's requirements and needs. These modules can be combined in any kind of ways. The main frame of the backrest (backbone) can be extended in height, which is in order to "grow" with the user.



The backrest panels can be stepless adjusted in width and height. Vertical movement is made possible by the vertical slots. If the panels are set at the maximum width size, the gap in the center can be filled by using an insert cushion. The panels can also be set off-center, to fit and follow a scoliosis of the user.



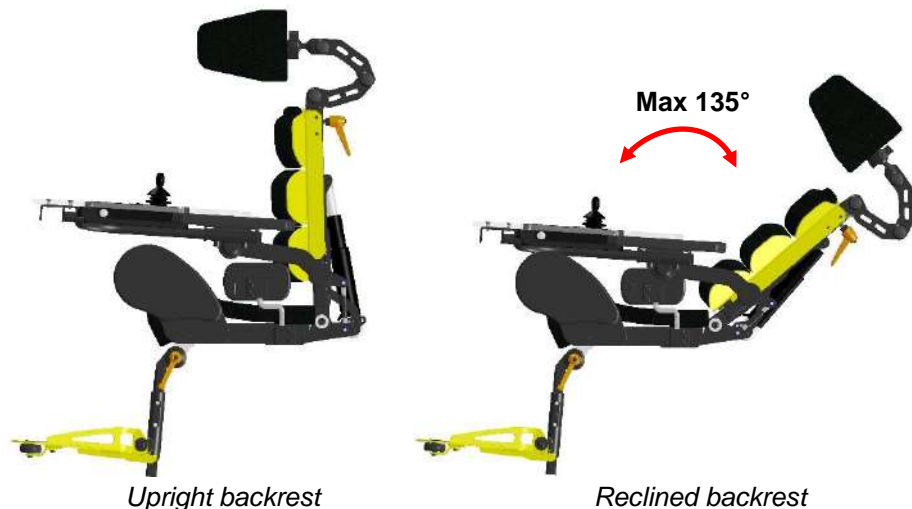
*Height adjustment*

*Added cushion in center*

*Scoliosis set up*

### 10.4.5 Power recline backrest (Optional)

The power recline backrest can be set from 85° to 135°. It gives the user the possibility to move into a relaxing position or a very active, upright sitting position.



The backrest has a build-in (optional) shear reduction to keep the backrest in the same position toward the upper body when reclining. The amount of shear reduction can be adjusted. If a fixed backrest is used, the backrest may come as fixed mount without shear reduction. It can be added afterwards as an upgraded option.

#### CAUTION

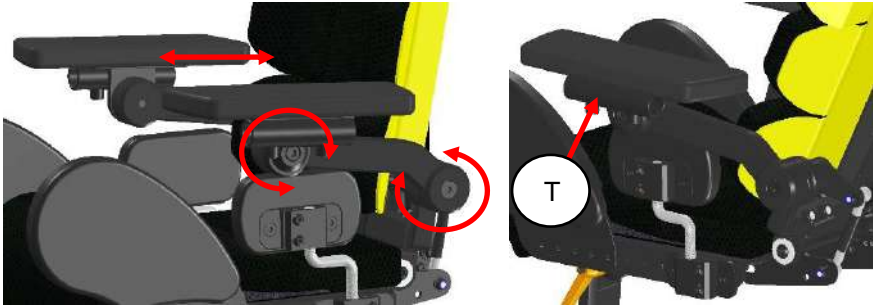
When reclining, it always checks if there is no obstructions close to the backrest, especially in the rear of the backrest.

#### CAUTION

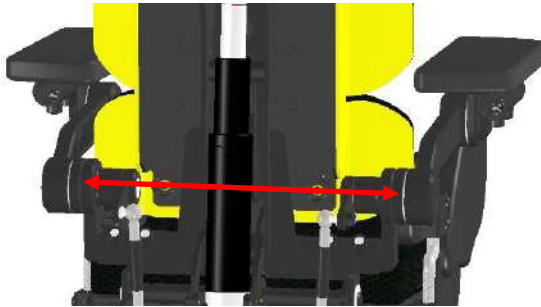
When reclining, the wheelchair can get longer. This has the influence on the driving characteristics of the wheelchair. Make sure there is enough space to drive and reduce the maximum driving speed.

### 10.4.6 Upholstered armrest

The PU upholstered armrests provide solid and comfortable support of the arm which result in a stabile seating position. The armrest has a soft PU upholstery on the top side which is easy to clean. Each armrest has an adapter tube for a joystick or table mount (T).



The armrests are adjustable in height, depth and angle. The distance between both left and right armrest is stepless adjustable to adapt to the width of the seat.



*Width adjustment of armrests*

There are two options in armrest mount:

- 1: Fixed armrest, mounted to the backrest.
2. Biomechanical armrest mount, which stay parallel to the seat pan.

Especially when a powered recline backrest is used, the biomechanical backrest keeps your arms in a natural, “parallel to the seat” position.

The armrests are designed in a clever way which makes an upgrade to biomechanical armrests afterwards possible without complicated rebuilds.

## 10.4.7 Legrest

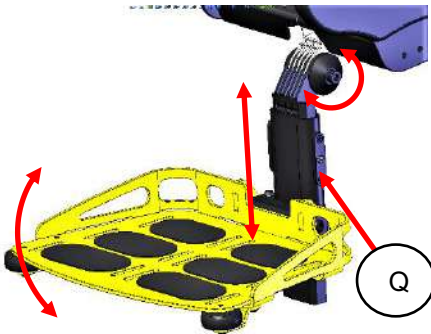
The legrest is adjustable in height, knee angle, footplate angle and the footplate can be flipped up. The footplate has slots (S) and thread holes to mount foot straps. The front edges of the footplate are secured with small bumper wheels to avoid damage to the footplate or walls in case of a collision.



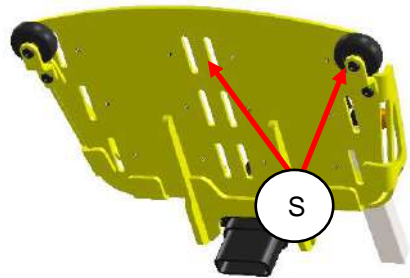
*Legrest with footplate*



*Footplate flipped up*



*Height angle adjustment*



*Bumper wheels and mounting slots*

By untightening the mounting block (Q) reversely, the dynamic range of legrest length can be shortened or extended.

### CAUTION

When stretching the legrest, it always checks if there is no obstructions close to the wheelchair, especially in the front of the wheelchair.

### CAUTION

When stretching the legrest, the wheelchair will get longer. This has the influence on the driving characteristics of the wheelchair. Make sure there is enough space to drive.

### 10.4.8 Powered legrest adjustment (Optional)

With a powered legrest the knee angle can be set from 90° up to a nearly fully stretched leg angle. The biomechanical movement (turning point at knee height) ensures the lower leg length will always remain the same.



*Legrest at 90 degrees*



*Legrest stretched*

#### CAUTION

When stretching the legrest, it always checks if there is no obstructions close to the wheelchair, especially in the front of the wheelchair.

#### CAUTION

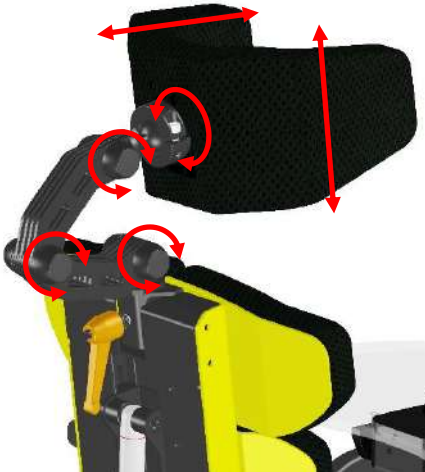
When stretching the legrest, the wheelchair will get longer. This has the influence on the driving characteristics of the wheelchair. Make sure there is enough space to drive.

#### NOTE

If the 90 degrees legrest isn't required but the stretching angle should be more, simply move the actuator mounting bracket on the seat pan one hole more forward.

### 10.4.9 Upholstered headrest (Optional)

The multi adjustable headrest is adjustable in height, depth, angle and shape to meet the requirements of the user. It can be taken off without losing its settings. As an additional option, a rail can be mounted between the backrest and headrest adapter to move the headrest out of center. Another option is a rotation block to rotate the headrest to the left or right.

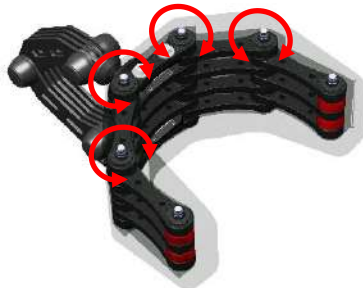


*Multi adjustable headrest*



*Standard headrest*

The standard headrest has a smaller headrest pad but is still adjustable in height, depth and angle.



The shape of the multi adjustable headrest can be changed from flat, to round, to edge shaped or any kind of shapes.

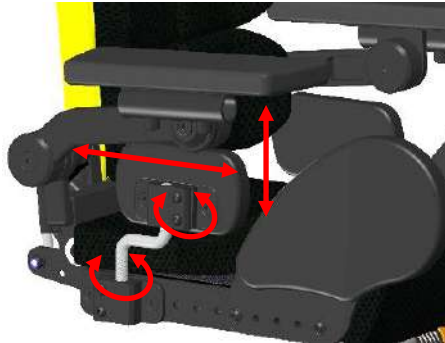
#### **i** NOTE

If the wheelchair user is transported in public transportation, we strongly advise to use the headrest. This provides you optimal stability whilst driving in the public transportation.



#### 10.4.10 Upholstered hip supports (Optional)

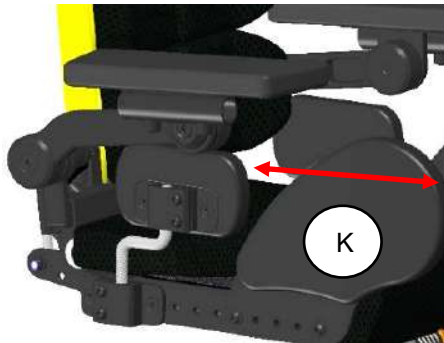
The upholstered hip supports offer side support to your hips or upper legs. The support is adjustable in height, depth, width and angle. The PU pads offer stable and comfortable support.



*Upholstered hip supports*

#### 10.4.11 Knee support panels (Optional)

The PU knee support panels (K) can be added to give more side supports in the front area of the seat cushion.



#### 10.4.12 Upholstered lateral supports (Optional)

The upholstered lateral supports offer side support to your trunk. The support is adjustable in height, depth and width. The soft pads offer stable and comfortable support. In addition, the support has swivel lock, which is fully adjustable and can be swing-away for easy transfer.



#### 10.4.12 Positioning belt

For positioning, several types of positioning belts are available.



*Fixed seat position belt*



*Automatic retraction position belt*

#### **i** NOTE

Positioning belts shall not be used as a car safety belt. If transported in a car, the user needs to wear, besides the positioning belt, an additional car safety belt.

## 10.5 The controls

### 10.5.1 Side steering control



*Side steering control*



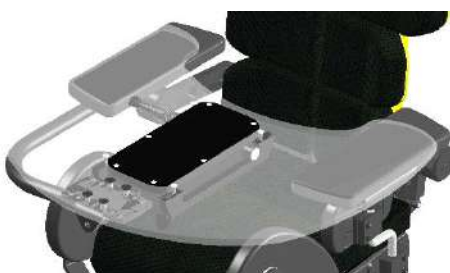
*Side steering, swing away*

The product has a side steering control unit, which is either mounted on the left or right armrest. The joystick module can be mounted on a fixed bracket or on an (optional) swing away mechanism. This system enables you to get access to a table.

### 10.5.2 Desktop control (Optional)



*Desktop control, driving position*



*Desktop control, flipped up*

The desktop control enables the user to have a center-mounted build-in joystick module. The table can be flipped up sideways for transfers. The joystick module can be flipped up to use the table as a desktop. When flipped up, the driving mode of the wheelchair is automatically blocked. This ensures a safe use of the wheelchair in any position.

#### **i** NOTE

After flipping the control back to driving position, you first need to switch the wheelchair off and on again to be able to drive (extra safety).

## 11. First setup

Before using, the wheelchair needs to be adjusted and set up for the user. In this chapter, we will explain all the setup which needs to be done before the first drive.

### CAUTION

Before using the wheelchair, it is vital to make the right setup for the user. A non-proper setup of the wheelchair might lead to uncontrolled driving which can result in personal or material damage.

### 11.1 Chassis suspension

The suspension of a chassis has been designed to increase the comfort whilst driving. Also climbing steps will be easier to have suspension on the chassis. But suspension can also be a disadvantage. A suspension which is set too soft has a negative influence on the control of the wheelchair. So it is very important to have a good setting.

#### 11.1.1 Spring setting



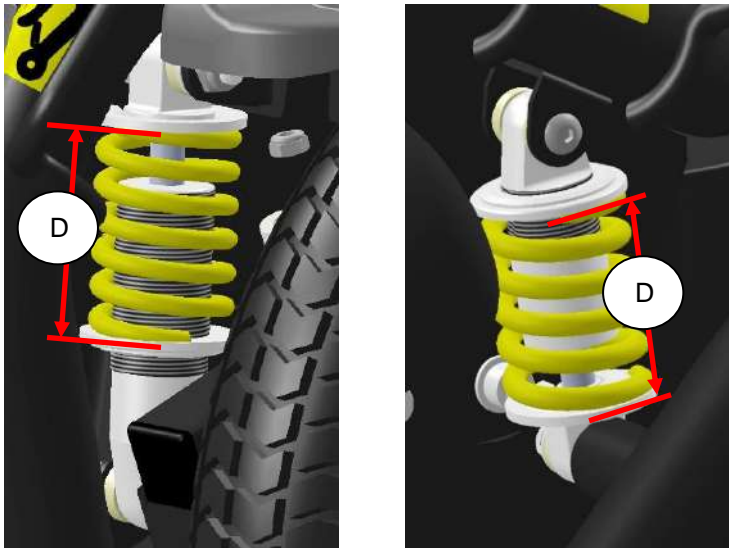
*Front spring damper unit*



*Rear spring damper unit*

Leon F wheelchair chassis has two spring damper units in the front, one for each wheel, and two spring damper units in the rear. The spring damper unit can be set at a certain amount of pre-tension (load) of the spring. The tension of the spring will be set by rotating the threaded ring which is compressing. By rotating the ring, you can either increase the tension, or reduce the tension of the spring. Increasing the tension on the spring, the wheelchair suspension becomes stiffer. This increases the mechanical traction and improves driving control.

The stiffness of the suspension can also depend on the user's weight. The settings need to be done by setting and testing. We advise you to start with a stiffer setting, since this results in the best driving control. If the suspension is too hard, you can set it softer by turning the ring more counterclockwise. To make sure the balance of the left and right spring is the same, we need to measure the setting of each one.



*Measure the spring setting in the front and rear*

The best way is to measure the distance (D) between both rings where the spring is clamped in mm. Make sure that the spring settings of left and right side are identical.

**⚠ CAUTION**

Too soft setting of the spring will result in a very spongy behavior of the chassis. The control of the wheelchair will be bad. Avoid too soft settings.

**⚠ CAUTION**

If the springs are unevenly set, it might lead to strange driving behavior of the chassis. This might result in personal or material damage.

**i NOTE**

After setting the suspension, it always drives slowly first and in an open space to test the result of the setting.

## 11.2 Seat adjustments

Before using the wheelchair, the seat must be set to the right size for the user. Mostly this will be done by your local supplier, together with your therapist. A well-adjusted seat will give you optimum support and comfort.

### 11.2.1 Seat width

To increase the seat width, the seat frame can be slide in and out to the required width in steps of 12.5 mm on each side. Please notice the following steps to increase the seat width:

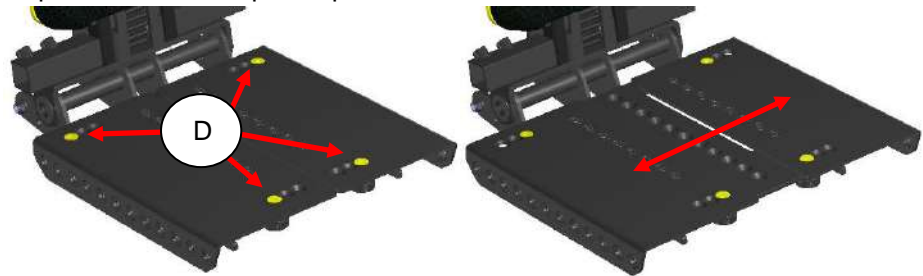


step 1: take off the seat cushion and the seat wedges, if mounted.



step 2: loosen the screws of the top seat plates (A) using an 4mm Allan key.

step 3: take off the top seat panels.



step 4: loosen the four bolts (D) of the base seat plate.

step 5: now we can move both panels outwards in steps of 12.5mm.

step 6: while the right seat width is set, tighten the four bolts again in the designated holes. Put back the top seat plate, re-tighten all the screws and finish the setting.

### 11.2.2 Seat depth

The seat depth is arranged by two seat panels overlapping each other. By changing the amount of overlapping, we can change the seat depth. To adjust the seat depth, we must take the following steps:



step 1: take off the seat cushion and the seat wedges, if mounted.



step 2: loosen the screws (A) using a 4mm Allan key of each seat panel.

step 3: slide the seat plates (left and right side) forward to the required seat depth in steps of 20mm.

step 4: tighten all the screws (A) again.

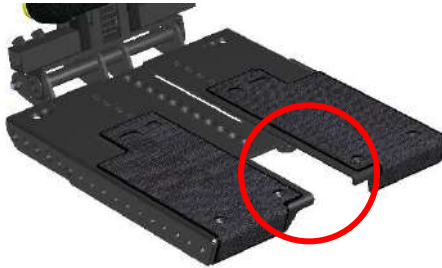
step 5: put the seat wedges and cushions back into place.

#### CAUTION

For adjusting the seat sizes, normally it will be handled by your local supplier, together with your therapist. If the seat depth gets much bigger, another size of cushions may be required. Contact your local supplier.

### 11.2.3 Adding the T-shaped panel

If the seat width is set to its widest size, a gap will appear between the two top seat plates.



For this issue we can use so-called T-shaped panel. This panel can be ordered separately as an option.



*Seat with T-shaped panel in the front*



*T-shaped panel mounted*

#### **i** NOTE

The T-shaped panel can be ordered independently as an option if the seat is set to a widest seat size.

#### **i** NOTE

If the seat size is set to a bigger size, you might need to order a new set of seat cushions which fit the new seat size range. Please contact your local supplier for further information.

#### **i** NOTE

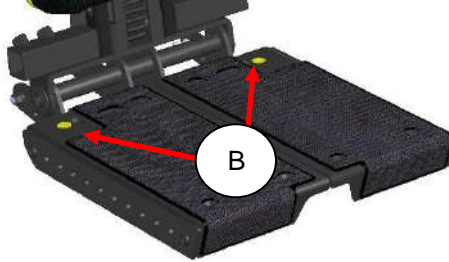
Please let your local authorized supplier to help you to change the seat size. They have the knowledge, tools and parts which you may need.



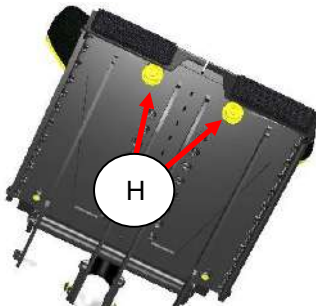
### 11.2.4 Seat spread adjustment

The seat can be spread out up to 15 degree on each side individually and must be set to the right size for the user. Mostly this will be done by your local supplier, together with your therapist. A well-adjusted seat will give you optimum support and comfort.

To adjust the seat spread, please take the following steps:



step 1: loosen the two bolts (B) in the rear edges of the seat slightly, and don't take them out.



step 2: loosen the two nuts (H) in the front side below the seat.

step 3: slide the top seat plate into the required angle (left and right can be adjusted independently).

step 4: tighten all the bolts (B) and the nuts (H) again.

#### NOTE

We advise you to change this setting with the help of your local authorized supplier, together with your therapist.

## 11.2.5 Knee support settings

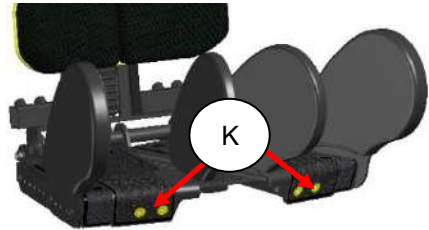
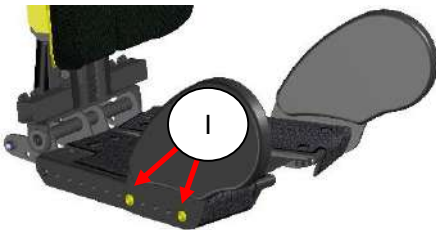
The optional knee supports can be mounted on the front of the seat on each side.



*Knee supports mounted outside*



*Knee supports mounted in- and outside*



*Mounting of the knee supports on the inside and outside*

To mount the outside knee supports, simply use the two bolts (I) and position the panel flat on the side of the seat plates into one of the mounting holes.

To mount the inner knee supports, also use the two bolts (K) to fix the support onto the front side of the seat plates.

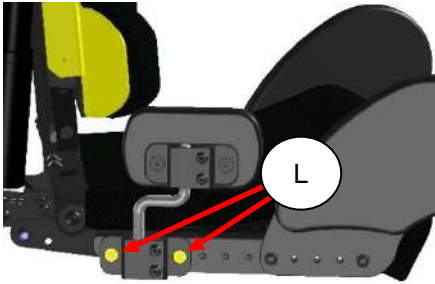
### **i** NOTE

Please let your local authorized supplier to help you to change the seat setting together with your therapist. They have the knowledge, tools and parts which you may need.

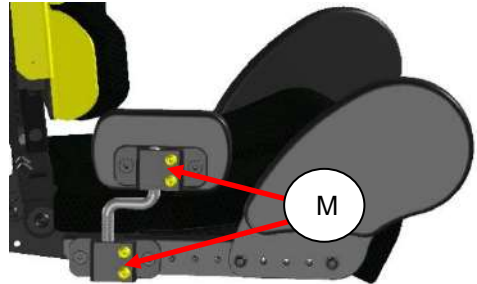
## 11.2.6 Hip supports settings

The hip support brackets can be mounted on the designated holes on the side of the seat plates.

step 1: use the two bolts (L) to mount the hip support.



*Mounting of hip support*



*Adjusting of hip support*

step 2: To adjust the height, depth, width and angle, loosen the four bolts (M) slightly, then the support can be moved.

step 3: Now move the hip support into the required position.

step 4: Once it is positioned right, tighten all four bolts again.

### **i** NOTE

When adjusting the hip supports, check carefully if there will be no collisions with other seat parts when activating the power function like backrest recline.

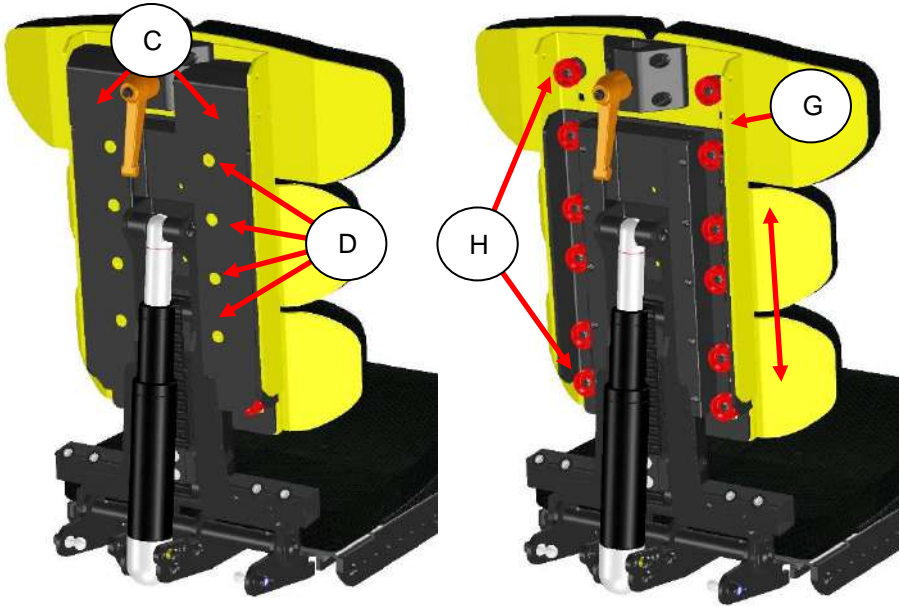
### **i** NOTE

Please let your local authorized supplier to help you to change the seat supports together with your therapist. They have the knowledge, tools and parts which you may need.

## 11.2.7 Backrest settings

### Setting the backbone height of backrest:

To adjust the backbone height, we need to remove the backrest covers (C).



step 1: to remove the backrest covers, loosen the bolts of both sides (D).

step 2: to change the height, loosen the range of hand nuts (H) slightly.

step 3: now you can pull up the yellow front backbone panel (G) to the required height.

step 4: tighten all the hand nuts to secure the desired height.

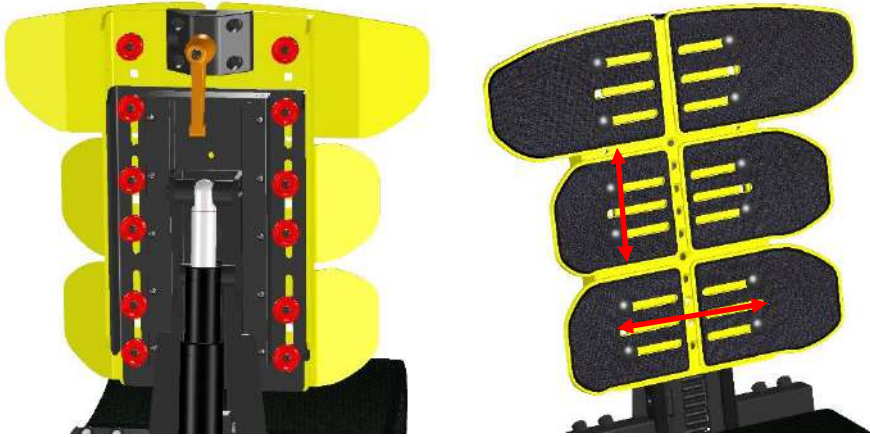
#### **i** NOTE

In some occasion, the hand nuts might have been replaced by ordinary nuts. This may be a request from the therapist or dealer who prefer to use tools to change the seat settings. For the same reason, the backrest covers may be mounted in order to “hide” the hand nuts.

## Setting the backrest width and height:

To set the width and height of the backrest panels, we need to take the following steps:

step 1: loosen the hand nuts of each backrest panel individually.



As you notice, the frame has vertical slots in the rear and horizontal slots in the front. With the design of these slots, we can move each backrest panel individually into its required position.

step 2: move the backrest panel into the desired width and height position.

step 3: tighten the hand nuts of each specific backrest panel.

step 4: repeat the same procedure for all the backrest panels

### **i** NOTE

To set the backrest panels into the required position, you do not need to take off the upholstery on the front side. This is only done here for informative reasons. Just loosen up the hand nuts and you're able to move the backrest panels.

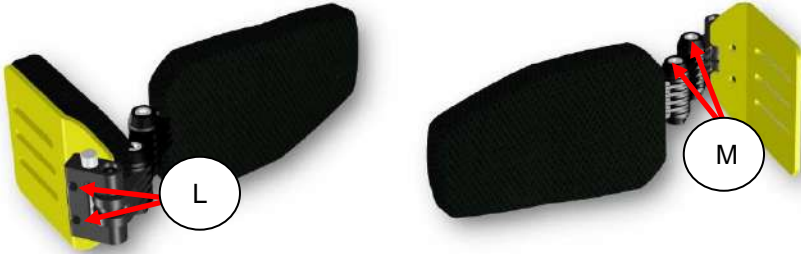
### **i** NOTE

Your backrest might have a different setup due to using different kinds of backrest panels. The pictures showed here are only informative to instruct the settings.

## 11.2.8 Lateral supports settings

The lateral support brackets can be mounted on the holes on the rear of the backrest panels.

step 1: use the two bolts (L) to mount the lateral support.



step 2: To adjust the depth and width, loosen the two bolts (M) slightly, then the support can be moved.

step 3: Now move the lateral support into the required position.

step 4: Once it is positioned right, thighten all four bolts again.

### NOTE

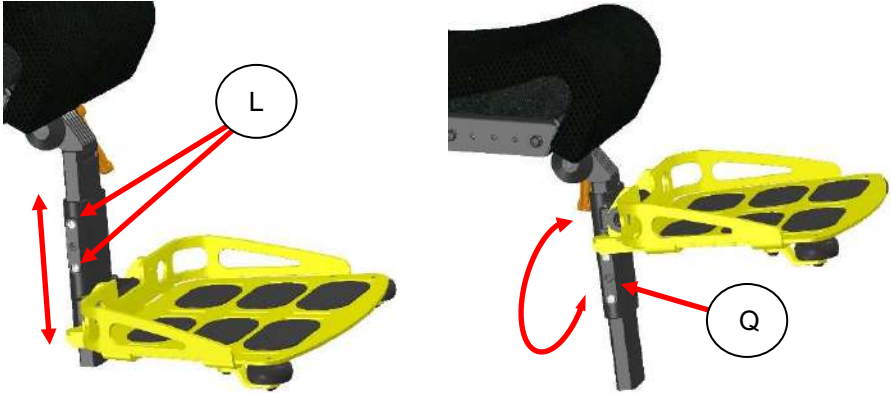
Please let your local authorized supplier to help you to change the seat supports together with your therapist. They have the knowledge, tools and parts which you may need.

## 11.2.9 Legrest settings

### Setting legrest length:

To adjust the legrest length, please take the following steps:

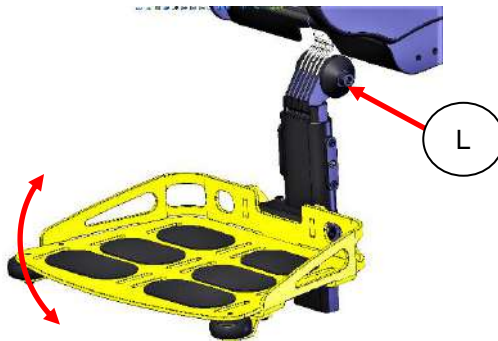
step 1: loosen the four bolts (L) whilst holding the legrest with one hand.



step 2: now move the legrest into the desired height and tighten all the bolts.

step 3: to set the legrest into an extreme short setting, we can disassemble the footplate bracket (Q) and turn it 180 degrees to mount it back again

### Setting legrest angle:



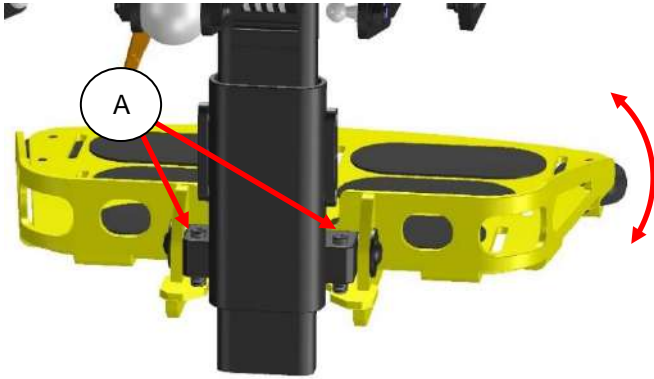
Step 1: loosen up the locking bolt (L) by turning it counterclockwise.

step 2: move the legrest in the required angle and hold it with one hand.

step 3: tighten the bolt by turning it clockwise.

## Setting footplate angle:

The footplate angle can be adjusted by rotating the two adjustment bolts (A) on the footplate bracket.



step 1: to reduce the angle between legrest tube and footplate, turn the both adjustment screws into the clockwise direction.

step 2: to increase the angle, turn the both adjustment screws into counterclockwise direction.

The adjustment can be done stepless to perfectly align the footplate angle to the user's needs.

### **i** NOTE

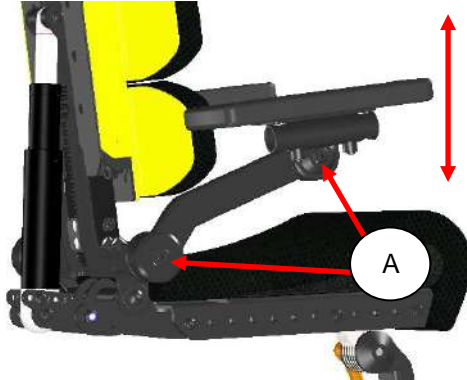
The adjustment bolts are secured by some blue loctite. If you change the angle frequently, it is advised to add a new blue loctite to the adjustment screw to retighten the position.



## 11.2.10 Armrest settings

### Setting armrest height:

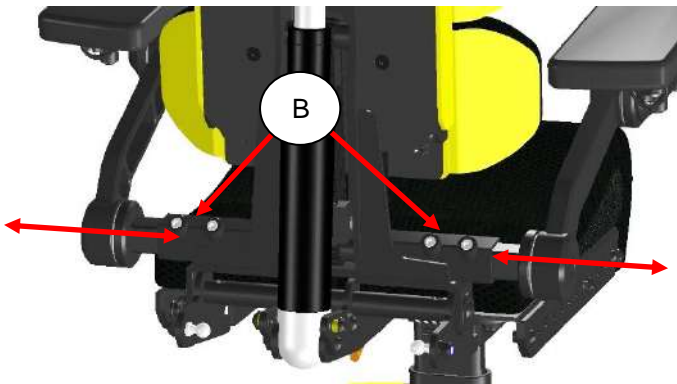
To adjust the armrest height, please take the following steps:



step 1: loosen up the bolts (A) slightly until the armrest can be moved. By loosening both rotation points of the armrest, it is possible to move the armrest up and down into the required height.

step 2: tighten all the bolts (A) to lock the position of the armrest.

### Setting armrest width:

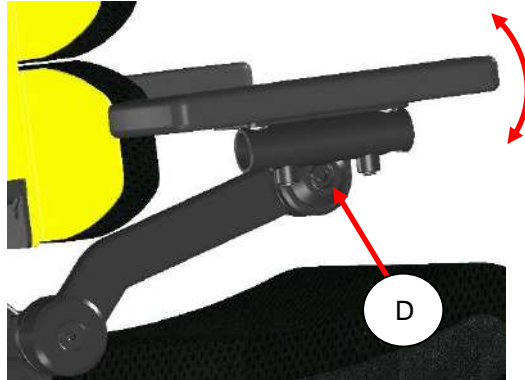


step 1: loosen up the four bolts (B).

step 2: slide the armrests outside into the required width position.

step 3: tighten the four bolts (B) to lock the position.

### Setting armrest angle:

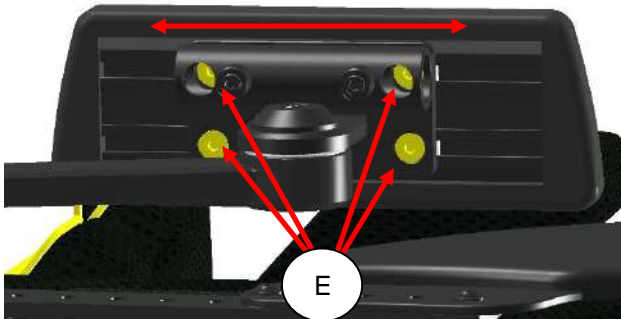


step 1: loosen up the bolt (D).

step 2: move the armpad into the required angle.

step 3: tighten the bolt (D) to secure the armrest angle setting.

### Setting armrest depth:



step 1: loosen up the four bolts (E).

step 2: slide the armrest pad into the requested position.

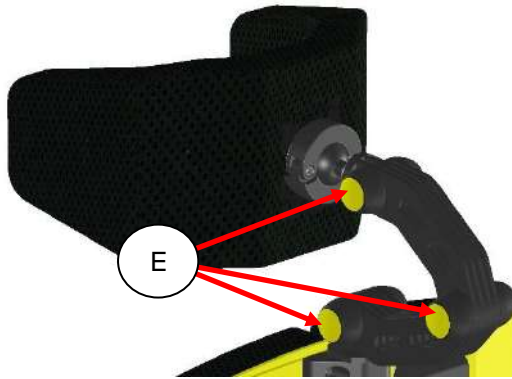
step 3: tighten the four bolts to secure the armrest pad position.

#### **i** NOTE

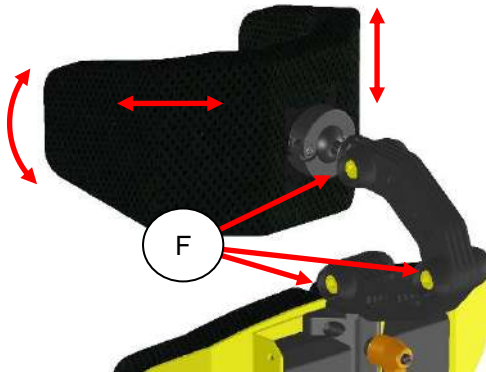
The two bolts which can be reached through the round tube may be obstructed by a joystick mount. Remove the joystick mount first, then loosen the two bolts.

### 11.2.11 Headrest settings

Headrest height, depth and angle settings:



step 1: remove the rubber covers (E) on the three headrest joints.



step 2: loosen the three bolts (F) until you can move the headrest.

step 3: move the headrest into the required position.

step 4: tighten all the bolts firmly to secure the headrest position.

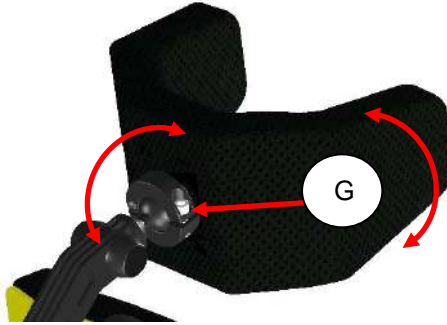
step 5: put the rubber covers back into the joints.

#### CAUTION

Be aware that if the bolts are loosened too much, the headrest may suddenly fall down. The best way is to loosen up a little bit until you feel you can move the joints. Now hold the headrest by one hand and move it. Then secure the position by tightening the bolt joint by joint.

### Headrest rotation point settings:

If the headrest has a ball joint option, you can change the angle of the headrest pad:



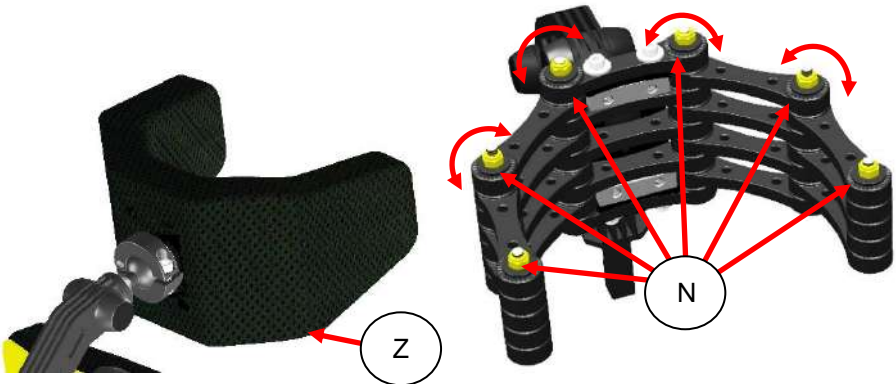
step 1: loosen the bolt (G) slightly until you feel you can move the joint.

step 2: move the headrest pad into the required position.

step 3: tighten the bolt (G) to secure the headrest position.

### Headrest shape settings:

step 1: unzip the zipper (Z) on the bottom of the headrest pad and take the cover off.



step 2: loosen all the nuts (N) so the joints can move.

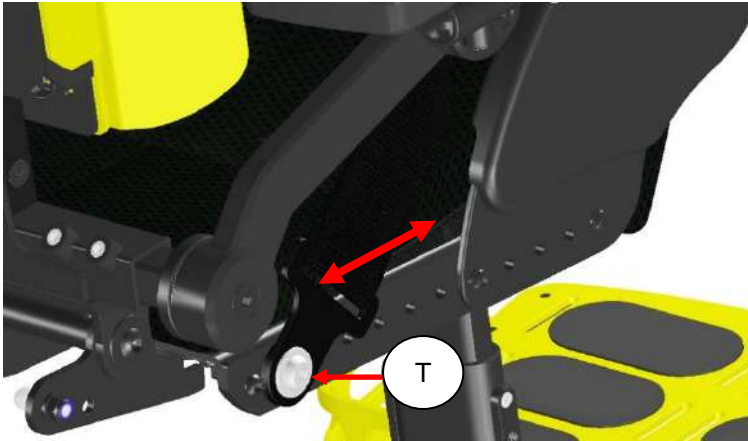
step 3: move the headrest joints to the required shape.

step 4: tighten all the nuts (N) to secure the shape of the headrest.

step 5: place the cover back over the headrest.

### 11.2.12 Positioning belt

The positioning belt can be optionally adjusted in length and anchoring point. To change the secure position, simply follow the next steps:



step 1: loosen the screw (T) using an 4mm Allan key.

step2: move the bracket in the required position.

step3: retighten the screw again.

#### CAUTION

Make sure the brackets are tightening properly to avoid sliding of the seat belt along the seat rail. A sliding seat belt might result in poor seating position of the user.

#### NOTE

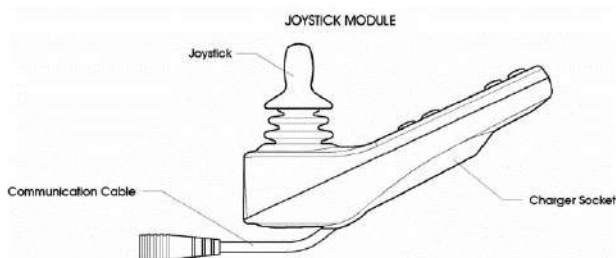
The positioning belt should not be used as a safety belt. If the wheelchair is transported in an occupied position, the user needs to wear an additional safety belt which is mounted in the vehicle he or she is transported in.

#### NOTE

We strongly advice to use both the positioning belt (to keep you in the right position in your seat) and the car safety belt to ensure you are safe during heavy braking or impact in the vehicle.

## 12 Control panel

The wheelchair uses a color screen joystick module. With this joystick module all functions of the wheelchair can be controlled. This joystick module can be mounted on the left or right armrest or even as an integrated desktop control unit.



The joystick module contains a few major components which will be explained separately.

### 12.1 Charging socket

The charging socket is used to charge the batteries. Whilst charging the batteries, the driving of the wheelchair is automatically blocked.

### 12.2 Joystick

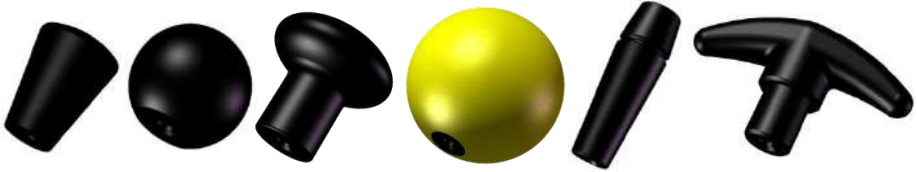
The primary function of the joystick is to control the speed and direction of the wheelchair. The further you push the joystick from the center position the faster the wheelchair will move. When you release the joystick, the brakes are automatically applied.

If the wheelchair is fitted with powered seat functions, the joystick can also be used to move and select the specific powered seat function.

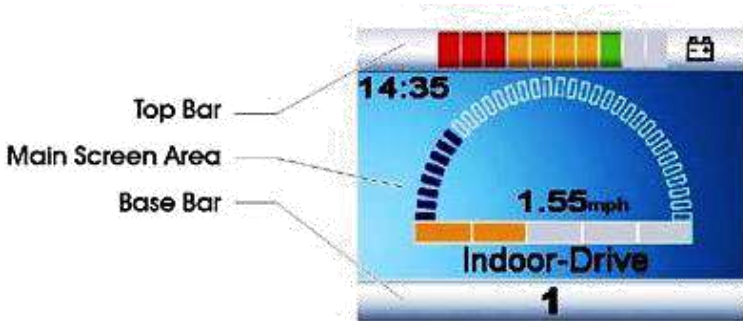
#### CAUTION

We strongly recommend practicing the function of the joystick before starting to drive with the wheelchair.

Several different shapes of joystick knobs are available to optimize the control of the joystick.



## 12.3 Display



The color LCD screen is split into 3 areas of information. The Top Bar, the Base Bar and the Main Screen Area.

### 12.3.1 Battery indicator (top bar)



This displays the charge available in the battery and can be used to alert the user to the status of the battery. If all LED's are on, the batteries are fully charged. If the capacity is lowered one by one an LED will erase. The bar is divided into three color zones: Green, orange and red. If only the LED are left it means the batteries will be almost empty and need to be charged. Beside the color you also have different LED lighting modes:

LED's Steady: This indicates that all is well.

LED's Flashing Slowly: The control system is functioning correctly, but you should charge the battery as soon as possible.

LED's Stepping Up: The wheelchair batteries are being charged. You will not be able to drive the wheelchair until the charger is disconnected and you have switched the control system off and on again.

### 12.3.2 Focus light (top bar)



When the wheelchair system contains more than one method of direct control, such as a secondary Joystick Module or a Dual Attendant Module, then the Module that has control of the wheelchair will display the In-Focus symbol.

### 12.3.3 Profile name (main screen)

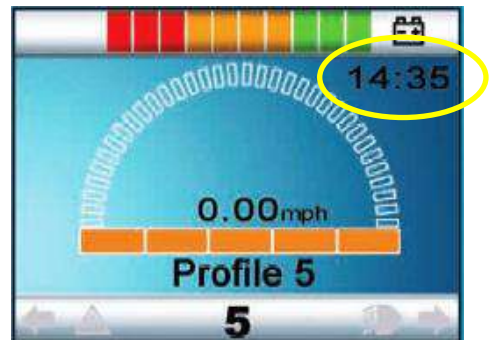
The profile name shows in which drive profile you are now. The name of the profile can be programmed to your wishes by your local supplier. The wheelchair can have up to 8 different driving profiles. Each profile is set to a certain environment you want to drive in. Standard the wheelchair comes with an indoor- and outdoor profile.



### 12.3.4 Clock (main screen)

The clock displays the current time in a numeric format. The clock is user adjustable. Adjustable options are:

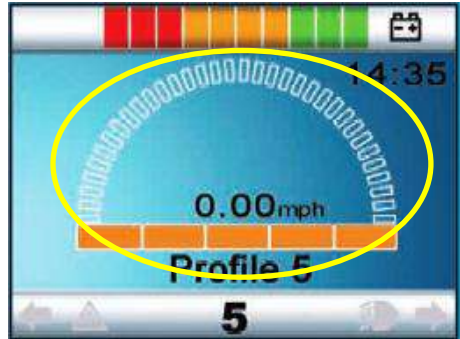
- Visibility, whether the clock is displayed on screen.
- The display format, 12 or 24 hour.
- The time, the user can adjust the time.





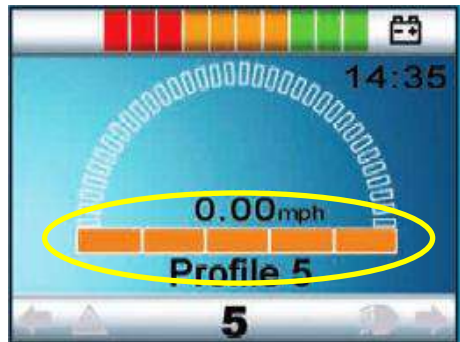
### 12.3.5 Speed display (main screen)

This gives a proportional display of the wheelchairs speed. The Arc begins at 0% and has a programmable maximum. The programmable parameter is Max Displayed Speed. The speeds can be set in mph or km/h. The standard setting km/h.



### 12.3.6 Speed bar (main screen)

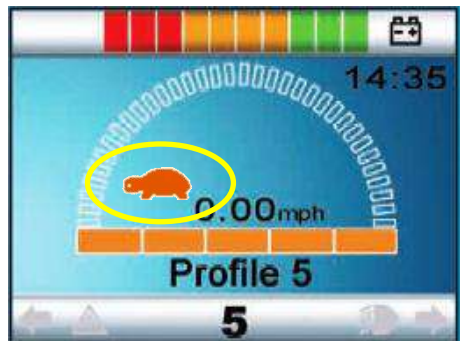
This speed bar displays the current maximum speed setting. It contains 5 steps in speed. These steps can be selected using the speed buttons, explained in the chapter "Buttons"



### 12.3.7 Inhibit (main screen)

If the speed of the wheelchair is being limited; for example, by a raised seat, then this orange symbol will be displayed.

If the driving is stopped by an inhibitor, the bunny will flash in red.



### 12.3.8 Set functions (main screen)

Displays the sections of the chair currently selected for movement, the name given to the selection and a direction arrow showing what sort of movement is available.



Besides the screen you use for driving or controlling the seat functions, there are also other screens which show information. The most common screen messages are explained in the next chapters.

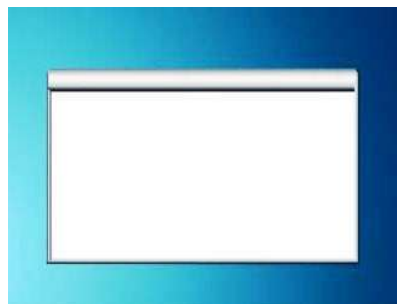
### 12.3.9 Additional options (main screen)

Additional screens can show the additional options of the electronic system. For example: Bluetooth, environmental control, mouse function. For more detailed information about these options, please contact your local supplier.



### 12.3.10 message screen (main screen)

The joystick module displays warning icons and informational messages, in a dedicated message window.



### 12.3.10.1 Restart message

This icon is shown when the system is to be restarted. (Most of the time when a module has been exchanged or added.)



### 12.3.10.2 Timer message

This symbol is displayed when the control system is changing between different states. An example would be entering into Programming Mode. The symbol is animated to show the sands falling.



### 12.3.10.3 Sleep message

This symbol will be displayed for a short time before the R-net enters into a sleep state.



### 12.3.10.4 Joystick deflected message

This message is shown if the wheelchair is started up and the joystick is not in its zero position. If you let go of the joystick, the system will start up normally and the message disappears.



### 12.3.10.5 E-stop message

If the External Profile Switch is activated during drive, or actuator operation, this symbol will be displayed.



### 12.3.10.6 Error codes

If something is wrong with the wheelchairs electronics, the wheelchair will stop driving and a trip code (error code) will be displayed on the screen of the Joystick module.



For more explanation about the trip code we refer to the chapter: trouble shooting.

### 12.3.11 Current profile (base bar)

The currently selected Profile is shown in numeric form.



### 12.3.12 Motor temperature (base bar)

This symbol is displayed when the control system has intentionally reduced the power to the motors, to protect them against heat damage.



### 12.3.13 Control system temperature (base bar)

This symbol is displayed when the control system has intentionally reduced its own power, to protect itself against heat damage.



### 12.3.14 Wheelchair lock

The wheelchair has the option so secure against unintended use. Therefore, the joystick module can be locked. This way it is protected against unintended use during storage or parking.

#### Lock options

The control system of the wheelchair can be locked in two ways: By using a button sequence on the keypad, or with a physical key. This key can be ordered as an accessory.

## Keypad locking

To lock the wheelchair by using the keypad lock:

- While the wheelchair is switched on, depress and hold the ON/OFF button.
- After 1 second the control system will beep.
- Now release the ON/OFF button.
- Deflect the joystick forwards until the control system beeps.
- Deflect the joystick in reverse until the control system beeps.
- Release the joystick, there will be a long beep.
- The wheelchair is now locked.
- The following  
displayed in the

screen will be  
control box:



*Wheelchair in locking mode*

To unlock the wheelchair:

- If the control system has been switched off, press the ON/OFF button.
- Deflect the joystick forwards until the control system beeps.
- Deflect the joystick in reverse until the control system beeps.
- Release the joystick, there will be a long beep.
- The wheelchair is now unlocked.

## Locking the wheelchair by using a physical key



To lock the wheelchair with the key lock:

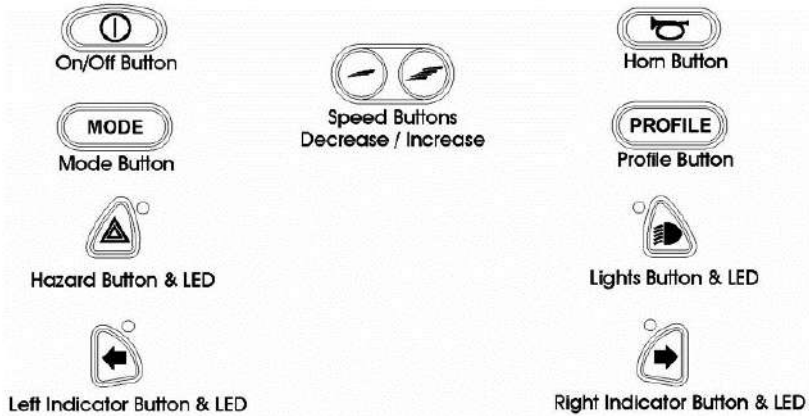
- Insert and remove the supplied PGDT key into the charger socket.
- The wheelchair is now locked.

To unlock the wheelchair:

- Insert and remove the supplied PGDT key into the charger socket.
- The wheelchair is now unlocked.

## 12.4 Buttons

The joystick module has several buttons which will be explained below.



### 12.4.1 On/Off button

The On/Off button applies power to the control system electronics, which in turn supply power to the wheelchair's motors. Do not use the On/Off button to stop the wheelchair unless there is an emergency. (If you do, you may shorten the life of the wheelchair drive components).

#### CAUTION

Always make sure the wheelchair is switched off before entering or leaving the wheelchair. If the wheelchair is switched on during transferring, there is a danger the joystick will be touched and the wheelchair will move.

### 12.4.2 Horn button

The horn will sound while this button is depressed.

### 12.4.3 Speed decrease button

This button decreases the speed setting.

#### **12.4.4 Speed increase button**

This button increases the speed setting. (It does not increase the maximum speed!).

#### **12.4.5 Mode button**

The Mode button allows the user to navigate through the available operating modes for the control system. The available modes are dependent on programming and the range of auxiliary output devices connected to the control system.

#### **12.4.6 Profile button**

The Profile button allows the user to navigate through the available Profiles for the control system. The number of available Profiles is dependent on how the control system is programmed.

Depending on the way the control system has been programmed a momentary screen may be displayed when the button is pressed.

#### **12.4.7 Hazard Warning Button and LED**

This button activates and de-activates the wheelchair's hazard lights. Depress the button to turn the hazards on and depress the button again to turn them off. When activated the hazard LED and the indicator LEDs will flash in sync with the wheelchair's indicators.

#### **12.4.8 Lights Button and LED**

This button activates and de-activates the wheelchair's lights. Depress the button to turn the lights on and depress the button again to turn them off. When activated the lights LED will illuminate.

#### **12.4.9 Left Indicator Button and LED**

This button activates and de-activates the wheelchair's left indicator. Depress the button to turn the indicator on and depress the button again to turn it off. When activated the left indicator LED will flash in sync with the wheelchair's indicator(s).

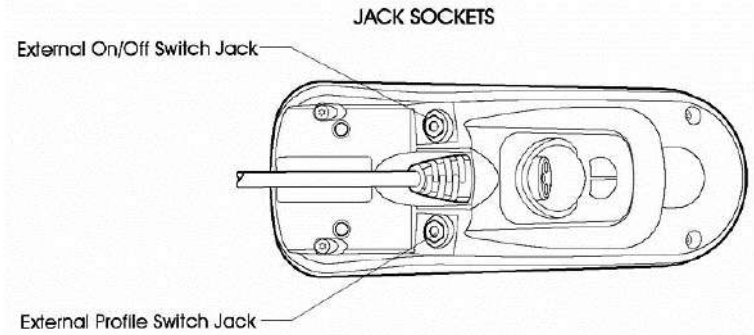


### 12.4.10 Right Indicator Button and LED

This button activates and de-activates the wheelchair's right indicator. Depress the button to turn the indicator on and depress the button again to turn it off.

When activated the right indicator LED will flash in sync with the wheelchair's indicator(s).

## 12.5 Jack sockets



### 12.5.1 External profile switch jack

This allows the user to select Profiles using an external device, such as a buddy button. To change the Profile whilst driving simply press the button. If the control system is set to latched drive or actuator control operation, then the polarity of the jack input is reversed to affect a failsafe system; meaning this input will provide an External Profile Switch function and an Emergency Stop Switch function.

### 12.5.2 External on/off switch jack

This allows the user to turn the control system on and off using an external device, such as a buddy button.

#### **i** NOTE

The Joystick Module is supplied with rubber bungs that must be inserted into the Jack Socket when no external device is connected.

## 12.6 R-net Connectors

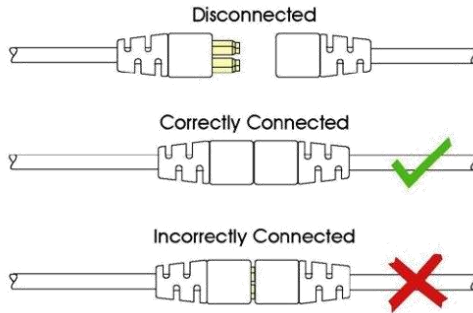
To connect the Communication Cables:

- Holding the connector housing, firmly push the connector into its mate until you can no longer see the yellow plastic.

The connectors are secured using a friction system.

To disconnect the Communication Cables:

- Holding the connector housing firmly, pull the connectors apart.



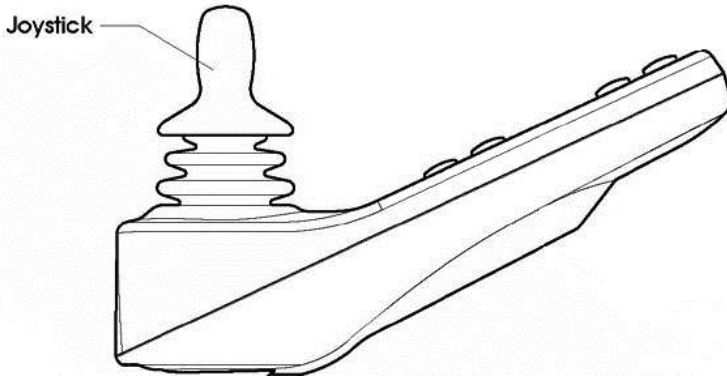
Do not hold or pull on the cable. Always grip the connector when connecting and disconnecting.

When the control system is first switched on after a connection, or system component change the Timer will be displayed whilst the system checks itself and then the re-start icon will be displayed. Switch the control system off and on again to operate.

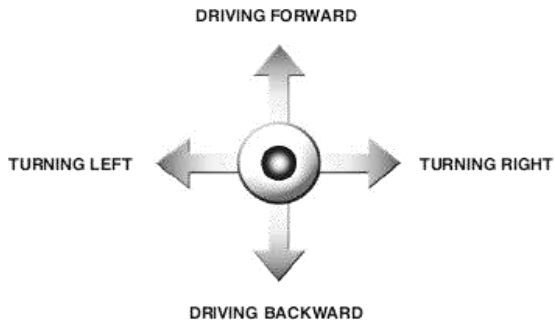
### CAUTION

If the communication is poor because of damaged cables, a trip code "bad cable" might be show on the display. Should this message appear on the display contact your local supplier to have the wheelchair checked.

## 12.7 Joystick



The joystick is primarily used to drive the wheelchair. Just push the joystick into the direction you want to drive, and the wheelchair will start to move in that direction.



The secondary purpose of the joystick is to navigate through menu of the wheelchair. By moving the joystick forward or backward you can scroll up or down through the menu, by moving to the right you can enter a sub selection.

### CAUTION

We strongly recommend practicing the function of the joystick before starting to drive with the wheelchair.

## 13 Electric system

### 13.1 Batteries

The wheelchair has two serial-connected 12-volt maintenance free batteries for the power supply. The capacity of the batteries can be up to up to 80Ah. (Battery box sizes L: 260 x W: 168 x H: 210 mm).

The batteries are fitted in the middle of the chassis to arrange a low center point of gravity. Both batteries are easily accessible for maintenance or replacement.



*Position and access of the maintenance free batteries*

#### CAUTION

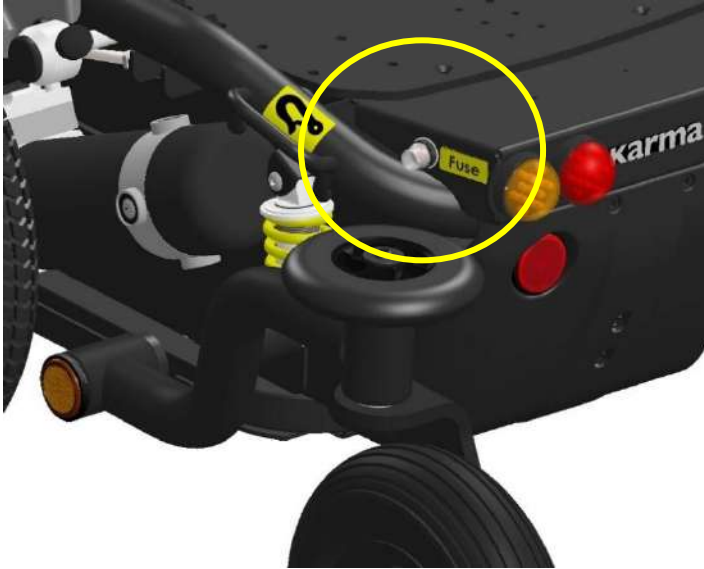
Be careful when using metal objects close to the batteries. A short circuit might easily create strong sparks and can cause a fire. Should you need to work on the batteries, use isolated tools and wear protective gear on hands and eyes.

#### CAUTION

Batteries are chemical components and shall be treated as such. In case of removal, one shall treat the batteries as chemical waste. The batteries need to be disposed according to the local regulations for chemical waste.

## 13.2 Main fuse

The wheelchair has one main fuse to protect the batteries against overload and short circuit. This main fuse is easy to reach and placed on the right front cover of the wheelchair. The electronics itself is completely protected against short circuit and overload.



*Position of the main fuse*

### CAUTION

If the fuse is blown, please contact your local authorized supplier. He should check the wheelchair first before replacing the main fuse. The fuse only blows if a serious problem occurs.

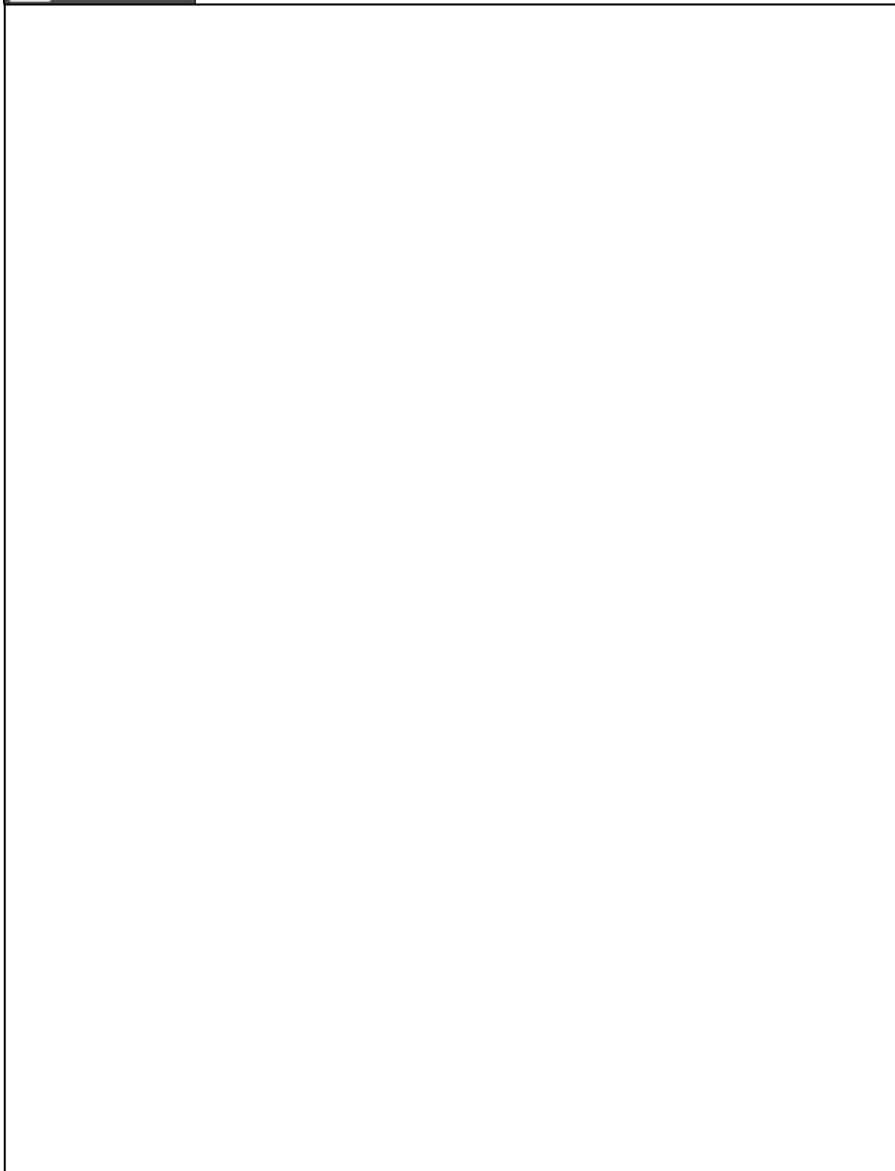
### CAUTION

Only use original spare part fuses of Karma. Using other fuses might damage the electronic system or even cause fire.

## 14 Using the wheelchair

### 14.1 General warnings and advices

Please read this section of the manual very carefully as it contains issues related to safety and possible hazards.



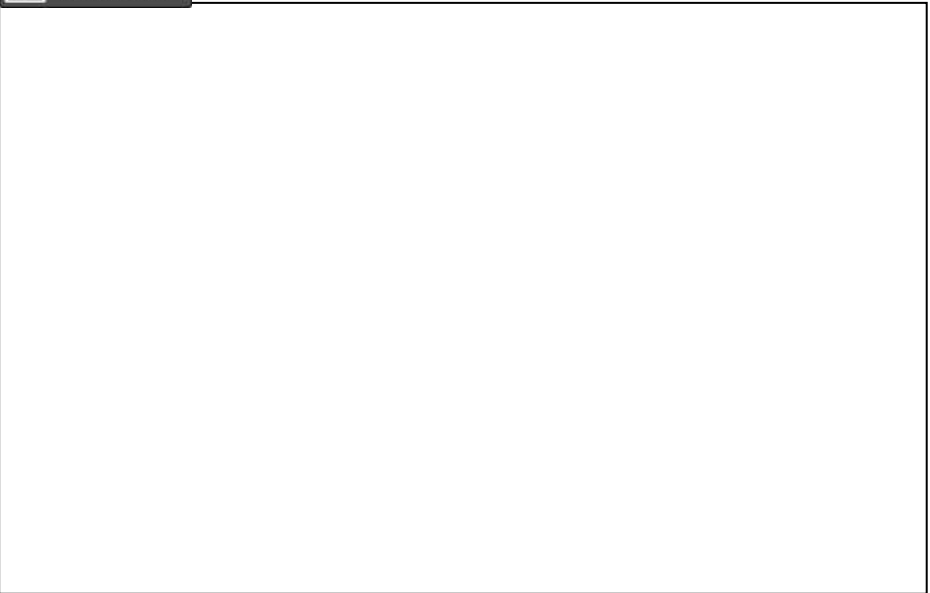
 **WARNING**

- Please pay attention to the environment, and to keep away from the hazard of external flame despite the seat having passed EN 1021-1/-2 test and battery terminal caps having passed V-0 (UL94) test.
- Before attempting to sit in or exit the powered wheelchair, turn the power OFF.
- A warning not to operate the wheelchair if it is behaving abnormally or erratically.
- A warning not to operate the wheelchair with depleted batteries, since the occupant could be stranded.

## 14.2 Use in combination with other products

Different- or customized seat:

 **WARNING**



 **WARNING**

Changes which are made by third parties are not covered by the warranty and responsibility of Karma Medical.

### 14.3 Hot and cold surfaces

 **WARNING**

Some parts of the wheelchair can reach high temperatures when exposed to direct sun. Please be careful with touching especially the plastic parts under these circumstances in order to prevent skin burning.

 **WARNING**

The wheelchair can reach low temperatures when exposed to cold weather (below zero degrees Celsius). Please take caution in touching especially the metal parts with wet body parts under these circumstances as they easily can freeze and get stuck to these surfaces.

### 14.4 Danger of pinching

#### User

Special care has been taken to make sure that the chance that the user pinches him or herself while seated in the wheelchair is minimal. However, there are few situations that might lead to injury. Special caution has to be taken under the following circumstances;

- When the tray table is closed, pinching of fingers or other body parts is possible between the locking parts.
- When the revolving control unit is used in the tray table, pinching of fingers or other body parts is possible when the control unit is being turned upside down.
- When adjusting the seat while the user is sitting in the chair, please note that no body parts are in the direct zone of the moving parts.

 **WARNING**

When moving the seat down, the tilt frame comes very close to the top chassis cover. This creates a pinching danger, when at this time, hands are on the top cover at the rear end of the chassis. For this reason a warning decal is placed on the top cover on the rear of the chassis.

We advise you to always keep your hands or the hands from other persons away from the rear end of the top chassis cover.



 **WARNING**

All areas where there might be a risk of pinching are indicated by these warning decal:



### 14.5 Surroundings

Special care has been taken to make sure that the change that the surroundings pinches him or herself is minimal. However, there are few situations that might lead to injury. Special caution has to be taken under the following circumstances;

- When driving the wheelchair, make sure that no persons or animals are in the near surrounding, because running over e.g. feet will lead to serious injury as a result of the high weight of the electrical wheelchair.
- When using the seat lift and/or the electrical tilt adjustment, make sure that no persons or animals are in the near surrounding, because it is possible to get pinched by the moving mechanism, although the moving parts are designed to be as safe as possible.

## 14.6 Precautions to prevent dangerous situations

In order to prevent dangerous situations please take note of the following precautions:

- Only charge the battery in well ventilated areas.
- Only drive at slow speed in the direct surrounding of other people or animals.
- Always turn on the head- and rear lights when using the chair under circumstances with limited sight like darkness or fog.
- Please do not allow any persons to stand or sit on the wheelchair except for the user.
- Make sure that the remaining battery power is sufficient for the distance that is to be bridged.
- Do not replace a damaged fuse before it is known why the fuse is blown and the cause is taken away.
- Have the wheelchair checked by your supplier after any collision or when the wheelchair is otherwise (visual) damaged.
- Check the tire pressure and refill the tires if necessary, every four weeks. Check the tires at the same time for wear and damage. Replace if necessary.
- In order to ensure that your wheelchair is in good condition, please contact Karma authorized dealers regularly and make further wheelchair inspection and maintenance records. We recommend that you inspect and maintain your wheelchair **every six months**.
- Do not change the programmed driving characteristics of your control unit, as it is specific for the situation of the user. If any adjustment is required because of a change of circumstances, please contact your supplier.

### **WARNING**

Always make sure that, when positioned on slopes, the brakes are attached (no Freewheel).

If the wheelchair is in freewheel mode, there is a risk that the wheelchair might start to move in an uncontrolled way. This might lead to personal or material damage.

## 14.7 Use on slopes: driving on downhill slopes

Driving on downhill slopes must always be done at a low speed and with great care. Avoid sudden braking, abrupt avoidance maneuvers and never maintain a speed higher than that at which you can maneuver the wheelchair in a safe and secure manner. Always be aware of the fact that the control of the wheelchair driving downhill is different than on level surfaces.



*Max. acceptable downhill slope*

### **i** NOTE

When driving on downhill slopes with an uneven or slippery surface (for example grass, gravel, sand, ice or snow) you should drive with extra care and attention.

### **i** NOTE

When driving on downhill you can use the tilt (if build in) to create a more stable seating position for yourself.

### **⚠** WARNING

Never drive downhill on slopes bigger than 6°. This might result into uncontrollable behavior of the wheelchair. This can lead to material or personal damage. (Dynamic stability according to ISO 7176-2= 6°).

**⚠ WARNING**

The position of the seat in height and angle or the position of the backrest has great influence on the stability of the wheelchair when driving on slopes. Make sure the seat is in the optimal driving position to avoid tipping over.

### 14.8 Use on slopes: driving on uphill slopes

Driving on uphill slopes must always be performed with great care and attention. Avoid sudden avoidance maneuvers and never drive at a speed higher than needed to maneuver the wheelchair in a safe and secure way. Avoid holes and bumps as much as possible. Drive slowly and controlled.



*Max. acceptable uphill slope*

**i NOTE**

When driving on uphill slopes with an uneven or slippery surface (for example grass, gravel, sand, ice or snow) you should drive with extra care and attention.

**⚠ WARNING**

Never drive uphill on slopes bigger than 6°. This might result into uncontrollable behavior of the wheelchair. This can lead to material or personal damage. (Dynamic stability according to ISO 7176-2= 6°).

**WARNING**

The position of the seat in height and angle or the position of the backrest has great influence on the stability of the wheelchair if driving on slopes. Make sure the seat is in the optimal driving position to avoid tipping over.

### 14.9 Driving on sideways slopes

Driving on a sideways slope must always be performed with great care. Avoid sudden avoidance maneuvers and never drive at a speed higher than needed to maneuver the wheelchair in a safe and secure way. Avoid holes and bumps as much as possible. Drive slowly and controlled.



*Driving on sideways slopes*

**NOTE**

When driving on sideways slopes with an uneven or slippery surface (for example grass, gravel, sand, ice or snow) you should drive with extra care and attention.

**WARNING**

Never drive sideways slopes bigger than 6°. This might result into uncontrollable behavior of the wheelchair. This can lead to material or personal damage. (Dynamic stability according to ISO 7176-2= 6°).

**WARNING**

The position of the seat in height or the position of the backrest has great influence on the stability of the wheelchair if driving on slopes. Make sure the seat is in the optimal driving position to avoid tipping over.

### 14.10 Obstacle climbing

Do not drive the wheelchair over obstacles of a height bigger than 50mm. Driving over tall edges increases the risk of tipping over as well as the risk of damage to the wheelchair. Always be aware when climbing obstacles of the stability of your wheelchair.



Driving down of a higher surface (like pavement), Always be aware of the sudden forward movement of your wheelchair when driving down of it. If your wheelchair has powered seat tilt, you can use the seat tilt for more stability whilst driving of the pavement.



**NOTE**

When driving over obstacles with uneven or slippery surface (for example grass, gravel, sand, ice or snow) you should drive with extra care and attention.

**WARNING**

Never drive on obstacles higher than 50mm. Always drive with maximum attention and great care.

## 14.11 Use in presence of electromagnetic fields

Use your cell phone only when the wheelchair is switched off. Although the wheelchair is tested and approved for electromagnetic interference, there is a very small change that strong electromagnetic fields from cell phones or some other electrical products lead to unexpected and unpredictable electrical reactions from the wheelchair.

Try to avoid the near presence of any radiation source such as radio's, cell phones etc. If your wheelchair reacts to a source of radiation with unexpected behavior, try to drive slowly to a safe place, turn off your wheelchair and try to extinguish the radiation source.

When it is unavoidable to use the wheelchair under these circumstances, be prepared for any unexpected and unpredictable electrical reactions from the wheelchair.

### WARNING

If you enter an area where there might a risk of strong electromagnetic interference, always reduce your driving speed and drive carefully.

### WARNING

Avoid area's where strong military transmitters are used. They might interfere with your wheelchair's electronics.

### WARNING

Avoid areas close to high voltage power lines. They might interfere with your wheelchair's electronics.

### WARNING

Avoid areas close to high frequency energy equipment, like high frequency welding machines. They might interfere with your wheelchair's electronics.

## 15 Driving the wheelchair

The wheelchair is designed for indoor and outdoor use. When driving indoors, you must be careful when driving in, for example, narrow passageways, when passing through doors and entryways as well as when using elevators, ramps, etc. Also be aware of the risk of things getting caught in the machinery when you use the electrical seat lift and seat tilt, in particular when the wheelchair has been run in under a table, workbench or something like that.

### WARNING

Always make sure the wheelchair is switched off before entering or leaving the wheelchair. If the wheelchair is switched on during transferring, there is a danger the joystick will be touched and the wheelchair will move.

Outdoors, you must remember to drive very slowly on steep downhill slopes and to be very careful when driving on uneven surfaces, on uphill slopes, with sideways slopes and when negotiating obstacles. Always maintain a safe distance from the edge when driving close to drop-offs and pavements.

### NOTE

We recommend that you should make repeated test drives in areas in which you know you feel secure so that you are quite familiar with how the wheelchair and its accessories behave in different situations before you begin using the wheelchair on normal roads and other public areas.

### 15.1 Driving in general

Make sure that the control system is mounted right, and that the joystick position is correct. The hand or limb you use to operate the joystick should be supported, for example by the wheelchair armrest. Do not use the joystick as the sole support for your hand or limb, the wheelchair movements and bumps could upset your control, which might result in uncontrolled driving.

1. Switch on the power by pressing the on/off button on the control panel.
2. Select the right profile (start with the indoor profile). It's preferable to begin with a low speed.
3. Set an appropriate maximum speed by pressing the decrease or increase button until the desired indicator lamp lights up for your type of driving. It is



- Carefully move the joystick forward to drive forward, and backward to drive backward.
- The speed of the wheelchair is adjusted continuously by the joystick being moved different distances forward and backward respectively. The wheelchair's electronics make creep driving possible over curbs (max. 50mm.). You can drive up to the curb, and then carefully drive over it.

**⚠ WARNING**

Always make sure the wheelchair is switched off before entering or leaving the wheelchair. If the wheelchair is switched on during transferring, there is a danger that the joystick will be touched, and the wheelchair will move.

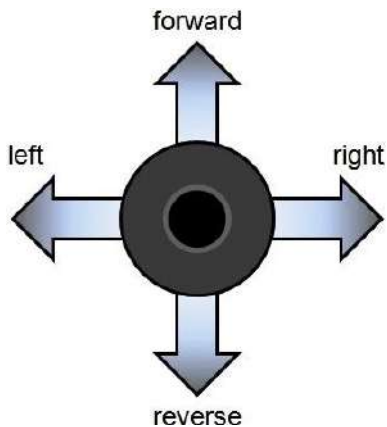
**⚠ WARNING**

Do not perform the first test drive on your own. The test drive is of course just a check of how you and the wheelchair function together, and you may need some assistance.  
Before driving, check that the wheel freewheel is set in the drive position.

## 15.2 Driving technique

The electronic control system of the wheelchair “reads” your joystick movements and transforms these “commands” into movements of the wheelchair. You will need very little concentration to control the wheelchair, which is especially useful if you are inexperienced. One popular technique is to simply point the joystick in the direction you want to go. The wheelchair will move in the direction you push the joystick.

Always think about driving as flexibly and fluently as possible and avoid heavy braking and avoidance maneuvers. The smoother you move the joystick, the smoother the wheelchair will drive.



### 15.3 Stopping the wheelchair

If you would like to stop simply move the joystick slowly towards the center and release the joystick. The wheelchair will come to a gentle stop. If you want to stop more quickly, simply let go of the joystick. It will put itself back into neutral position, which makes the wheelchair stop. Is there an emergency situation and you need to make an emergency stop, pull the joystick backwards. This will slow down and stop the wheelchair very fast.

#### WARNING

The stopping distance on slopes can be significantly greater than on level ground.

#### WARNING

Be careful driving backwards. You cannot really oversee where you are driving. It is better, when the space is available, to turn around and drive forward. By driving backwards not seeing where you are heading you might bump into something or someone. This can lead to personal or material damage.

#### WARNING

Be careful using the emergency brake. Especially when driving on slopes. Extreme braking might create the risk of tipping over when you are on a slope. Also, be aware that, during braking, you tend to lose balance yourself. If not strapped into a seat belt you might run the risk of falling out of your wheelchair whilst braking very hard.

### 16 Using the powered seat functions

If your wheelchair has powered seat functions like seat lift, seat tilt, backrest recline and/or powered legrest, you can control them by using the menu on the joystick module.

To enter the seat function menu, push the button "Mode" on the joystick module. You will leave the drive mode.



*Screen example of the seat function menu*

By moving the joystick to the left or right you can switch between different powered seat function. Once the required seat function is shown on the display, move the joystick forward or backward to activate the seat function in one direction. As long as you deflect the joystick from center the function will move. Release the joystick and the seat function movement will stop.

**i NOTE**

The acceleration and speed of each seat function can be programmed by your local authorized supplier. Should you request a different setting, please contact your local authorized supplier.

### **16.1 Using additional function of the wheelchair menu**

If your wheelchair has additional function built in like the blue tooth mouse function, you can control this using the menu and joystick.

To enter the blue tooth mouse menu, push the button "Mode" on the joystick module. You will leave the driving mode. The first screen you will see is the powered seat function screen. If you push the "mode" button once more, you will enter the blue tooth screen. Now the joystick becomes the mouse for using the PC or laptop.

For further information about the additional options, we refer to your local authorized supplier.

## 17 Handling the mechanical brakes

The drive motors of the wheelchair have electromechanical brakes. The brake can be released to set the wheelchair into freewheel mode. In freewheel mode the wheelchair can be pushed. This might be necessary to move the wheelchair in certain cases.

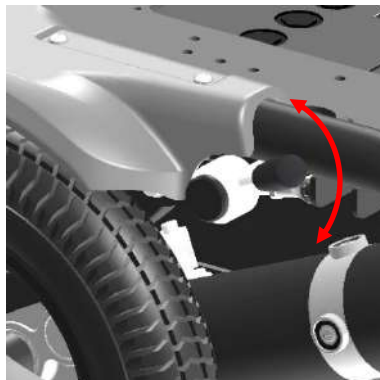
### 17.1 Release the mechanical brakes

To release the mechanical brakes, take the following steps:

Look for the red lever on each side of the front battery-box.

Around the lever is an instruction sticker which shows the direction to open or lock the mechanical brake. Move the lever into the "open" position on each motor. Now the wheelchair is in freewheel mode and can be pushed.

To lock the brakes, move the lever in to the "lock" position on both motors.



#### NOTE

If you want to put the wheelchair into freewheel mode, be sure to switch the electronics first. Leaving the electronics switched on will result a large resistance whilst pushing in freewheel mode.

#### WARNING

If the parking brake is released (free-wheel mode), the wheelchair cannot be driven by the electronics. Therefore, the release of the brakes should only be done in emergency cases and or for servicing. If the user is on board, the parking brakes should always be attached.

#### WARNING

Always make sure that, when positioned on slopes, the brakes are attached (no Freewheel). If the wheelchair is in freewheel mode, there is a risk that the wheelchair might start to move in an uncontrolled way. This might lead to personal or material damage.

## 18 Charging the maintenance free batteries

The amount of charge in your maintenance free batteries is depending on a number of factors, including the way you use your wheelchair, the temperature of the maintenance free batteries, their age and the type of maintenance free batteries used. These factors will affect the distance you can travel in your wheelchair. All wheelchair maintenance free batteries will gradually lose their capacity when they get older.

The most important factor that is reducing the life span of your batteries is the amount of charge you take from the batteries before you recharge them. The maintenance free battery life is also reduced by the number of times you charge and discharge the batteries. Normally the amount of cycles is between 300 and 700 times. To make your maintenance free batteries last longer, do not allow them to become completely discharged.

Always recharge your maintenance free batteries promptly after they are discharged. If your battery gauge reading seems to fall more quickly than usual, your batteries may be worn out. If your wheelchair shows these indications, please contact your local authorized supplier to have the maintenance free batteries checked.

### 18.1 Battery level

The power level of the batteries is displayed on the LCD screen of the joystick module.



*Battery indicator*

If the maintenance free batteries are fully charged, all ten LED's on the top bar light up. The more energy is used the more LED extinguish, starting on the right side.

If only the red LED are still on, it indicates that recharging of the maintenance free batteries is required.

If only two red LED's are flashing, it indicates that the maintenance free batteries are empty and should be charged immediately.

**i NOTE**

If the battery indicator shows only two segments in flashing, you should charge the batteries as soon as possible. This flashing is a warning signal. You are still able to drive the wheelchair but only for a short distance. If the batteries reach a level where they cannot supply enough energy to control the wheelchair in a safe way. The wheelchair will stop and give an error warning saying "low battery voltage"

**i NOTE**

If the batteries should be drained completely, it is important that you charge them up again as soon as possible since a complete loss of charge reduces the lifespan of the batteries.

**i NOTE**

Information about the charger which is supplied with the wheelchair can be found in the user manual of the charger itself. You can find the charger user manual in the tool bag which comes with the wheelchair.

**i NOTE**

Some local dealers supply the wheelchair with their own brand of batteries and battery charger. For information about these batteries and charger, you should ask your local authorized supplier.

## 18.2 Charging socket

The charger socket can be found on the front side of the joystick module. If the wheelchair has an integrated desktop control, the charger socket will be on the side of the joystick module.



*Charger socket position*



*Charger*

The wheelchair can be delivered with a battery charger. This charger has a capacity to charge up to 11 amperes. This charger will fully charge the batteries within 8 hours.

### **i** NOTE

For more detailed information about the charger and its functions, we refer to the manual which comes with the charger.

### **i** NOTE

In some occasions putting in the charger socket yourself can be very difficult. Sometimes you would like to have the charger socket on a specific place on your wheelchair. For this reason, the Wheelchair has an additional charger socket which can be placed on the spot you can reach yourself. For more information, please contact your local authorized supplier.

**WARNING**

Be sure that the charger plug is pushed fully in position. You will not be able to drive the wheelchair when the charger is connected. If the wheelchair does drive with the charger plugged in, contact your local authorized supplier.

**NOTE**

In some occasions it might be the case that your local supplier will deliver the wheelchair with a different brand charger. In that case your local supplier will inform you about the functionality of that charger and will also make sure the charger comes with a user manual.

### 18.3 Disposal of broken or worn out batteries



Batteries don't last forever. Therefore, batteries need to be changed after a certain period. The safest way is to have this done by authorized personnel of your local supplier. Batteries are chemical waste and need to be treated as such, using protective clothing, gloves and glasses.

**WARNING**

Replacing damaged or old batteries needs to be done by authorized personnel wearing protective clothing, gloves and safety glasses.

**WARNING**

Old or damaged batteries are classified as chemical waste and need to be disposed according to the local regulations for chemical waste. Please contact your local supplier for further details.



## 19 Transport of the wheelchair

### 19.1 Transportation using Dahl Docking station

Leon F Kameleon has also been crash tested using a Dahl docking station tie down system according to ISO 7176-19:2008, where the wheelchair is facing forward in driving direction (driving direction like the driver seat)



*Leon F Kameleon crash test using Dahl Docking station*

The locking of the wheelchair into the Dahl Docking station makes it much easier to lock down the wheelchair for occupied transportation. It can be used also for wheelchair users who want to drive the car by themselves.

The system is self-locking and can be release by pushing a button. The locking device will open for a certain time to make the un-docking possible.



#### **WARNING**

The Dahl Docking station is only allowed to build into a vehicle by trained and authorized staff of a registered car adaptation company. For ordering the Dahl Docking and its accessories, please contact Dahl Engineering in Denmark for further details. You can find Dahl at [www.dahlengineering.dk](http://www.dahlengineering.dk)

### 19.1.1. Mounting of the Dahl locking adapter on the wheelchair

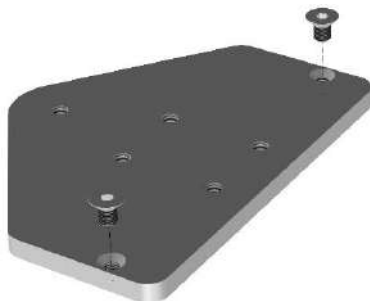
The Leon F chassis can be equipped with a Dahl docking plate underneath the battery box frame of the chassis.



*Leon F chassis with Dahl Docking plate mounted.*

For detailed information about the Dahl Docking system, please visit the homepage: [www.dahlengineering.dk](http://www.dahlengineering.dk)

To fit the Dahl docking plate, Karma has created a special kit for Leon F/ Leon chassis which included the base mounting plate and two mounting bolts. This kit is available under Karma part no: 191700000061



*191700000061 Dahl Leon F / Leon mounting kit*

**WARNING**

The Dahl Docking station is only allowed to build into a vehicle by trained and authorized staff of a registered car adaptation company. For ordering the Dahl Docking and its accessories, please contact Dahl Engineering in Denmark for further details. You can find Dahl at [www.dahlengineering.dk](http://www.dahlengineering.dk)

To mount the Dahl locking plate on the Leon F chassis, take the following steps:



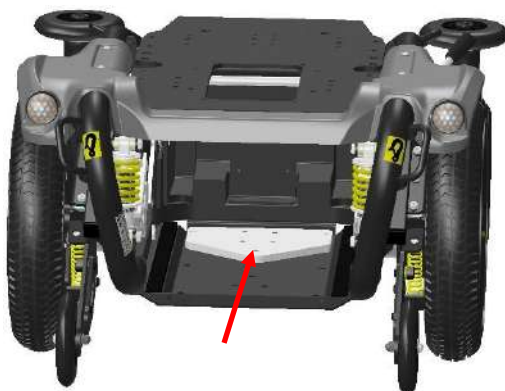
Step 1: remove the front cover bolts and lift the cover off by first tilting it.



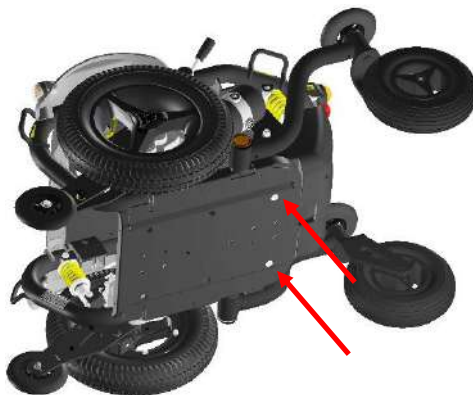
Step 2: loosen the 4 locking bolts of the battery box.



Step 3: pull out the battery box and disconnect main battery cable.



Step 4: place the mounting plate inside the chassis on the bottom



Step 5: tighten the two bolts into the mounting holes to fix the mounting plate.



Step 6: mount the Dahl locking plate by using the 5 high grade Dahl bolts on to the chassis. Secure them with Loctite 222 and tighten them, but not too tight. (20-24Nm).

**i NOTE**

The special Dahl high grade Torx bolts (Dahl part no: 502800) only come in one length which is often too long. They need to be cut into the right length by the authorized engineer to fit the locking plate properly without damaging the batteries.

Step 7: Place the battery box back into the chassis and connect the batteries to the electronics.

Now, the Leon F chassis is ready to be docked into the Dahl Docking station.

**Docking station in the vehicle:**

The mounting of the Dahl docking station into your vehicle shall only be executed by an authorized car adaptation company. They will get the right support and information from Dahl Engineering how to mount the docking station into the designated vehicle.



*Dahl Docking set*

**⚠ WARNING**

The Dahl Docking station is only allowed to build into a vehicle by trained and authorized staff of a registered car adaptation company. For ordering the Dahl Docking and its accessories, please contact Dahl Engineering in Denmark for further details. You can find Dahl at [www.dahlengineering.dk](http://www.dahlengineering.dk)



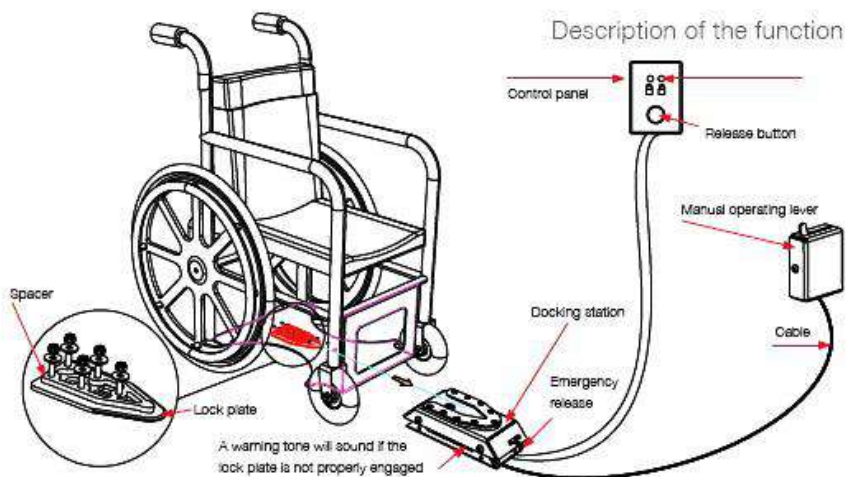
*Dahl docking station*



*Dahl docking station mounted on the floor*



*Docking station and docking plate on chassis*



### 19.1.2. Locking procedure

Drive the wheelchair slowly into the vehicle and make sure you center your wheelchair in the middle of the docking module. If being well positioned the locking system will also guide the wheelchair into the docking station. Keep in slowly driving until you feel the wheelchair is hitting the end position in the docking station. At the same time, you will hear a clicking sound. The wheelchair is now locked into the docking station. The light on the control panel will light up de LED showing the wheelchair is locked in correctly. Now switch the wheelchair off.

#### WARNING

If the wheelchair is not centered correctly, it might not be possible to lock in top the docking station. In that case, retry by driving a bit backwards and re-center the wheelchair. Try once more until you hear the clicking sound and you see the locked sign LED on.

After the wheelchair is locked in, put the car safety belt on according to the instruction in chapter 19.1.5.

#### NOTE

The positioning belt is not to be used as a safely belt. If the wheelchair is transported in an occupied position, the user needs to wear a safety belt which is mounted in the vehicle he or she is transported in. Additionally, we strongly advice to keep the positioning belt strapped as well as it secures you position in the seat. A car safety belt doesn't fulfil that support. So, use both and you are safe and positioned.

#### WARNING

Do not forget to put the car safety belts on before driving in the vehicle. This on order to avoid dangerous situations and personal- or wheelchair damage.



### 19.1.3 Unlocking procedure

To unlock the wheelchair, first open up the car safety belt. Then switch on the wheelchair and switch to drive mode. Now push the release button of the Dahl Docking station. You will hear a firm click. The locking bolt is now retracted, and the wheelchair can drive in reverse direction out of the Docking station.

#### **i** NOTE

After pushing the release button of the Dahl Docking station, the locking bolt is retracted for a certain period of time. After that time, the bolt will lift up again and lock the Docking station. Make sure you drive your wheelchair out of the Docking station in this time window of the unlocked position. If not, you have to push the release button one more time.

### 19.1.4 Manually unlocking in case of electric failure or accident

The Dahl Docking station can be unlocked manually in case of an emergency or if the electric unlocking is failing.



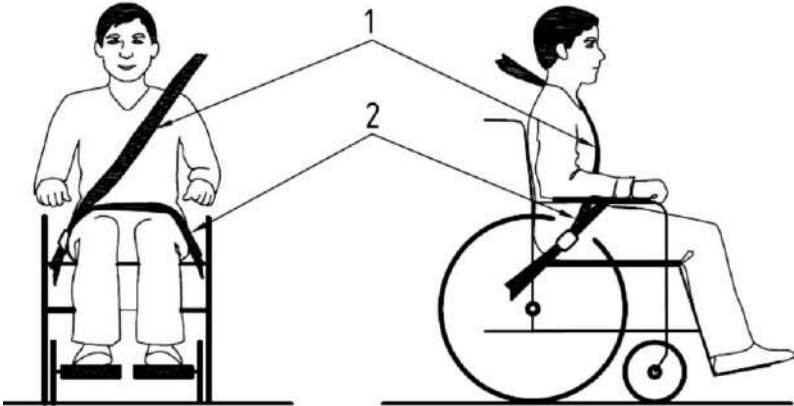
To unlock the docking station manually, the red lever needs to be pulled to the right. This retracts the locking bolt manually so the wheelchair can be released out of the docking station.

#### **!** WARNING

In case of a failure of the docking station, contact your local car adaptation company who has built in the device into your vehicle. Only authorized and trained staff is allowed to work on the docking device.

### 19.1.5 Safety belt

If the user is transported in his wheelchair, it is necessary to use a car safety belt to secure the wheelchair user.



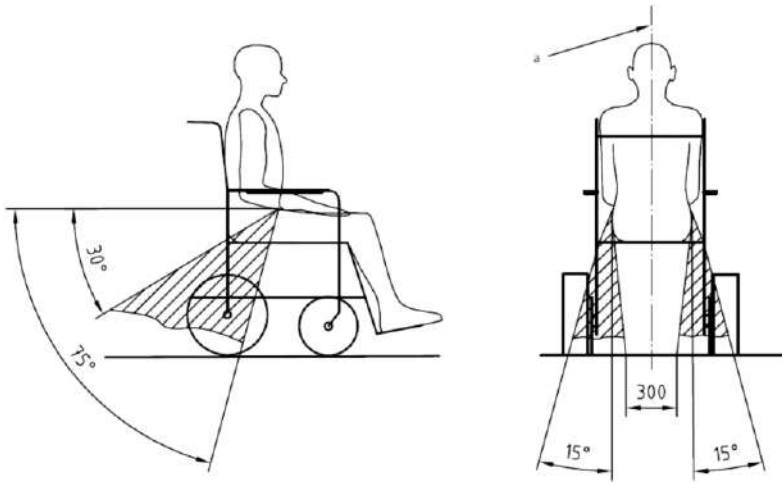
*Positioning of the car safety belts for wheelchair users*

The wheelchair has been crash tested using a Dahl 3-point occupant safety belt, model 500984. We advise you to use a similar system or a system that is equally specified. It is very important to use the safety belt in the right angles according to the wheelchair user. The angle for the pelvis part (2) of the safety belt must be in angle of 30- 75 ° with the horizontal plane. (See picture below). Also, the side angle should stay between the vertical planes to maximum of 15° angle with the vertical plane. (See picture below).

#### **i** NOTE

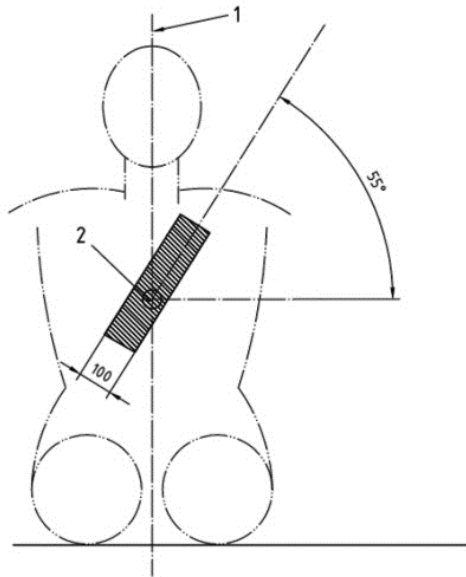
The positioning belt is not to be used as a safety belt. If the wheelchair is transported in an occupied position, the user needs to wear a safety belt which is mounted in the vehicle he or she is transported in.

Additionally, we strongly advice to keep the positioning belt strapped as well as it secures you position in the seat. A car safety belt doesn't fulfil that support. So, use both and you are safe and positioned.



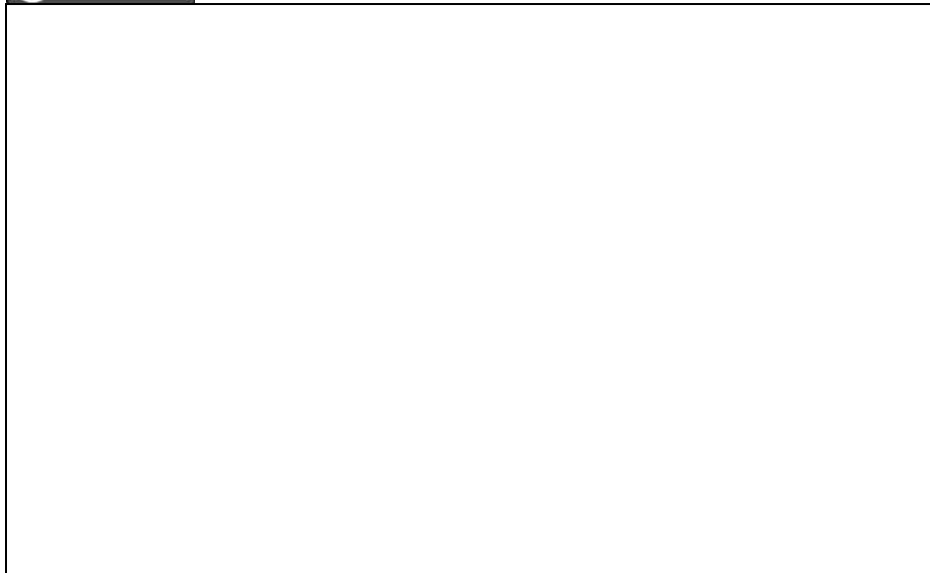
*Optimal angles for a safety belt used by the wheelchair user*

The shoulder part (1) of the safety belt should be positioned according to the figure below.

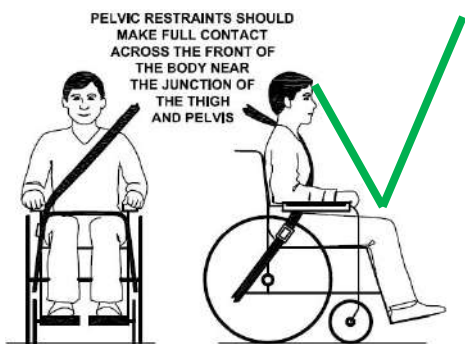


*Shoulder safety belt positioning*

**i** NOTE



*Picture of improper belt fit*



*Picture of proper belt fit*



NOTE

A large, empty rectangular box with a thin black border, intended for writing a note or providing additional information.

## 19.2 4-point tie down restraint system

The wheelchair must only be transported in a vehicle that is approved or adapted for such purposes. It is safest if the wheelchair is separated from the driver's compartment. Transportation in a trailer is also an optional recommendation. Should the wheelchair be transported in an MPV/estate car or other vehicle, it is vital that the wheelchair is properly fixed and that the fixing points of the car are well anchored. In all situations of transportation, the wheelchair needs to be properly fixed using a 4-point heavy duty webbing restraint to prevent the wheelchair from sliding or tilting while driving. Check that the wheelchair is properly fastened and that the parking brakes are engaged. The wheelchair can be locked into position by using fastening straps through the brackets in the front and the back, each marked with an indication sticker.



*front transportation loops*



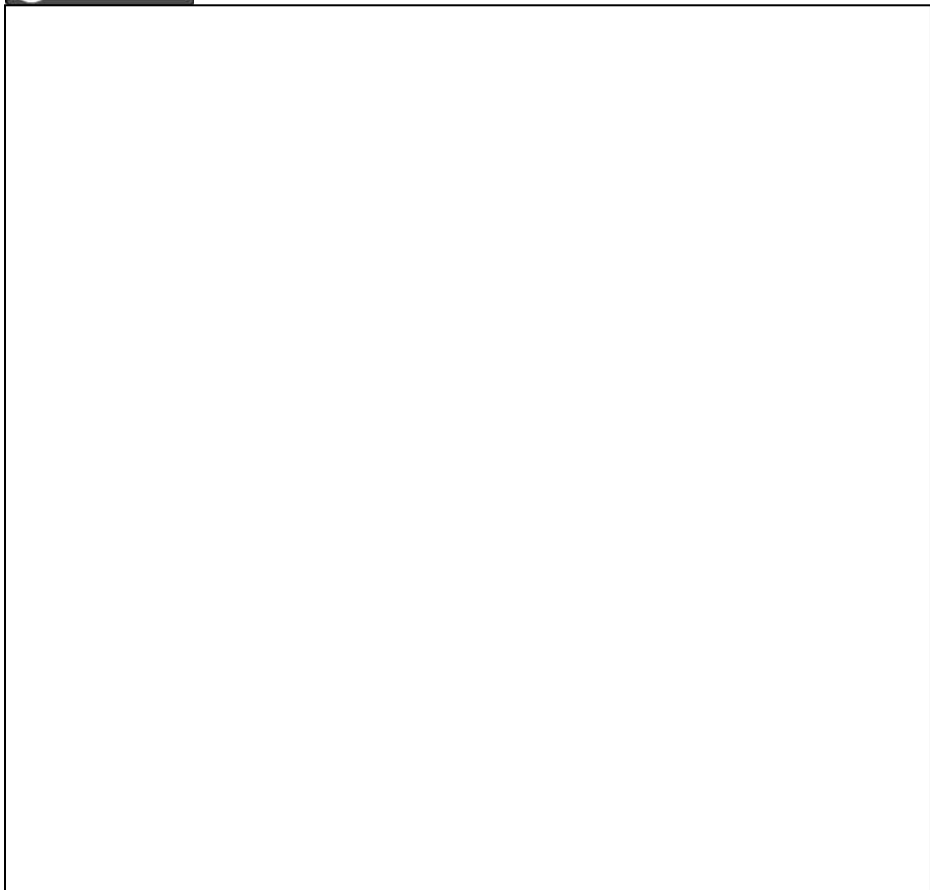
*rear transportation loops*

### **i** NOTE

The specifications of the wheelchair are in accordance with the requirements specified in ISO 7176-19:2008

Secure the wheelchair according to the manufacturer of the vehicle restraint systems instructions. Always make sure that the fastening points on the transport vehicle are well anchored. Use of this is strongly advised since the heavy wheelchair can cause serious problems in case of a car accident. The wheelchair fulfils all requirements according to the ISO 7176-19:2008 standard ("Wheeled mobility devices for use in motor vehicles").

**i** NOTE



**i** NOTE

The position belt of a wheelchair is not meant to be used as a car safety belt. It only prevents the user from sliding out of the seat while driving the wheelchair. If a user is transported in his wheelchair, he or she should wear an extra car safety belt, which is attached to the vehicle like all the car safety belts.

**i** NOTE

When shipped by boat, please give special attention to prevent contact with salt water or air. Salt water is extremely corrosive and might lead to unwanted damage of the product.

### 19.2.1 Transportation guideline

The wheelchair has a 4-point heavy duty webbing restraint. Using two brackets on the front end and two brackets on each rear side of the chassis. The brackets are indicated with a sticker. These securing points and its location have been designed and successfully tested according to ISO7176-19:2008



The angle of the straps should be around 45° to the horizontal plane. This is to have maximum effect in vertical and horizontal direction.



The straps must be connected to the vehicle at suitable anchor points. Make sure that the tire pressure is at the recommended level, so the straps can have maximum effect. Make sure the straps are tightened to maintain optimal security.

#### **WARNING**

Poor fixations of the wheelchair in a vehicle might cause damage to the vehicle itself, the wheelchair or the passengers inside the vehicle while driving. Not using a car safety belt while sitting in a wheelchair might lead to serious injuries in case of an accident.

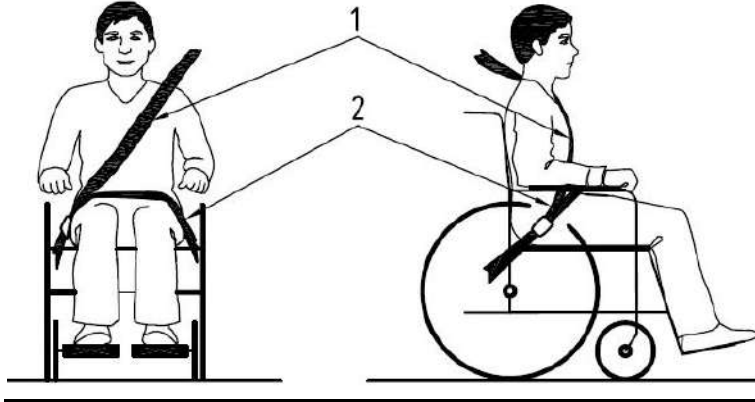


**WARNING**

Alterations or substitutions should not be made to the wheelchair securement points or to structural- and frame parts or components without consulting the wheelchair manufacturer.

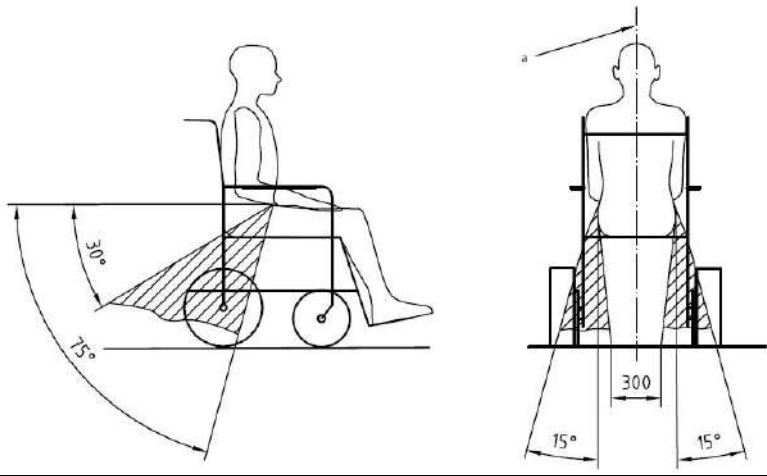
### 19.2.2 Safety belt

If the user is transported in his wheelchair, it is necessary to use a car safety belt to secure the wheelchair user.



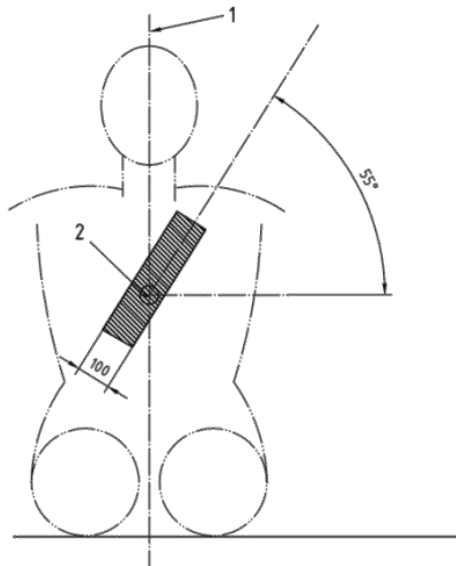
*positioning of the car safety belts for wheelchair users.*

The wheelchair has been crash tested using a heavy duty Dahl tie down belt, model 501780 or 501781, and a 3-point occupant restraint (Dahl part no: 500984). We advise you to use a similar system or a system that is equally specified. It is very important to use the safety belt in the right angles according to the wheelchair user. The angle for the pelvis part (2) of the safety belt must be in angle of 30- 75 ° with the horizontal plane. (see picture below). Also, the side angle should stay between the vertical planes to maximum of 15° angle with the vertical plane. (see picture below).



*optimal angles for a safety belt used by the wheelchair user*

The shoulder part (1) of the safety belt should be positioned according to the figure below.

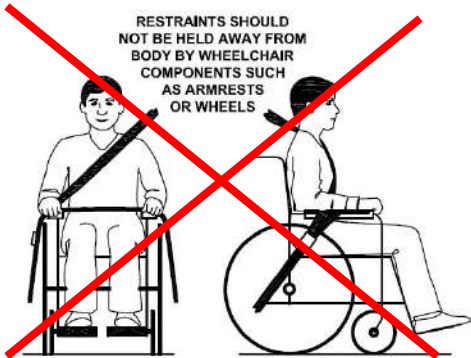


*shoulder safety belt positioning*

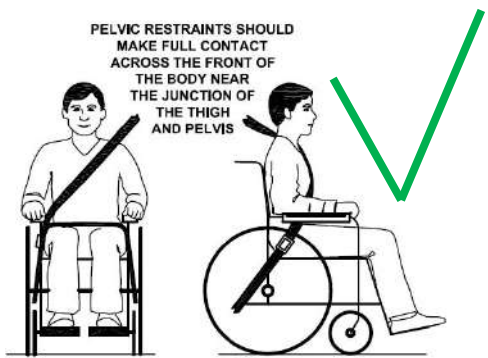


NOTE

A large, empty rectangular box with a thin black border, intended for writing a note or providing additional information.



*picture of improper belt fit*



*picture of proper belt fit*

**i** NOTE



## NOTE

- Alterations or substitutions should not be made to the wheelchair securement points or to structural and frame parts or components without consulting the manufacturer.
- Only use "gelled electrolyte" batteries on powered wheelchairs when used in a car.

### 19.3 Backrest, legrest and headrest settings during transportation

During transportation in an occupied position, the backrest of the wheelchair needs to be set into an upright position. The legrest should be in a knee angle close to 90 degrees. The headrest needs to be adjusted well so it will catch the head of the wheelchair user during the rebound of an impact, this to reduce the risk of a whiplash.



*Recommended position of the backrest, legrest and headrest*



## NOTE

We strongly advise you to remove the table or table control before transportation in a vehicle. The table can cause personal damage in case of an emergency brake or impact.

## 19.4 Transportation on an airplane

When transporting your wheelchair by air, you should primarily pay attention to the following in below:

### 19.4.1. Batteries

*Gel batteries:* In most cases, they do not need to be removed from the wheelchair. The batteries only need to be disconnected from the wheelchair. To do this simply disconnect one of the battery pole connectors.



*Position of the battery pole (behind the black cover)*

*Acid batteries:* Most airlines require that batteries be removed from the wheelchair and transported in special boxes that the airline may provide.

When transported by air, the wheelchair will be put with other goods in a confined space. Therefore, it is important to take preventive action to minimize transport damage to the wheelchair. Cover the control panel with soft, shock-absorbing material (foam plastic or similar) and fold it in towards the back rest. Protect other protruding objects in a similar manner. Tape any loose cables to the seat or covers.

### 19.4.2. The wheelchair's dimensions and weight

How much the wheelchair weighs and how large it is are important, depending on the type of airplane in which the wheelchair is to be transported. The smaller the airplane is, the smaller the wheelchair may be/weight and vice versa. Always check with the airline what rules apply.

## 20. Maintenance and repairs

The user and attendant have to take care of some maintenance, service and occasionally fault-finding activities. Other activities as described in this paragraph should be carried out under supervision of your authorized dealer.

### 20.1 Battery charging

This wheelchair is provided with two maintenance free batteries. During normal use, the batteries must be charged every day. It is most convenient to make it a daily practice to charge the wheelchair during the night.

#### NOTE

- Only charge in a well-ventilated room with no sources of open fire.
- Turn of the control unit before charging
- Make sure the charging cable is not causing crashes of people
- When the charger is disconnected from the wheelchair, also disconnect the charger from the mains.
- Place the charger in a place where it can radiate its heat freely during charging .

After having taken care of these precautions, charge the batteries by plugging in the charger in the rear of the control unit first. Plug in the charger in the mains secondly. Read the manual of your charger carefully for any other precautions and user prescriptions. When the wheelchair is not used over a longer period, recharge the batteries every four weeks to keep the batteries in good condition. If the batteries are not charged regularly, the remaining capacity will quickly drop.

### 20.2 Short term storage

For the charging process to produce a battery with good capacity, the temperature in the storage room should not be lower than +5 degrees. If it is stored at a temperature below +5 degrees, there is a higher risk that the battery has not been fully charged when it comes to be used and also a higher risk of corrosion.

### 20.3 Long term storage

The battery may be stored in an unheated room, but it should be charged at least once a month for maintenance purposes.

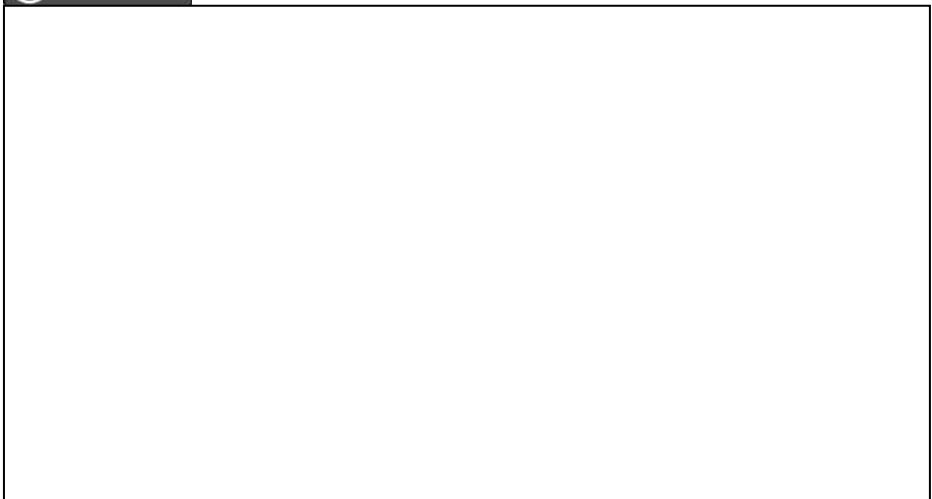
#### NOTE

When the wheelchair is stored for a long term, we advise you to disconnect the batteries from the wheelchair. This way the batteries will hold their energy for a longer period.

When re-using the wheelchair, the batteries will be installed and fully charged.

Ask your local authorized supplier to store and maintain the batteries if they are not used for a long period (more than two months).

#### NOTE



#### WARNING

Be careful when using metal objects close to the batteries. A short circuit might easily create strong sparks and can cause a fire. Should you need to work on the batteries, use isolated tools and wear protective gear on hands and eyes.



## 20.4 tools

The wheelchair comes with a tool kit to be able to adjust most settings.



### **i** NOTE

Some repairs may require tools other than those supplied with the wheelchair.

### **⚠** WARNING

The main fuse must always be removed when batteries are replaced. Always switch off the power supply to the control panel before interrupting the power with the main fuse.

### **i** NOTE

Any unauthorized alterations to the wheelchair and its systems may lead to an increased risk of accident. All alterations to and interventions in the wheelchair's vital systems must be performed by an authorized service engineer. In case of doubt, always contact an authorized service engineer.

### **⚠** WARNING

Damage caused by self servicing or servicing by unauthorized personnel cannot be claimed under warranty!

If you have any doubt in the capability of yourself or the service engineer, please contact your local authorized supplier to help you.

## 20.5 Wheels and tires

Check at regular intervals that the wheelchair's tires have the correct tire pressure.

Check regularly that the tire pressure is okay. We suggest checking the tire pressure at least every 4 weeks.

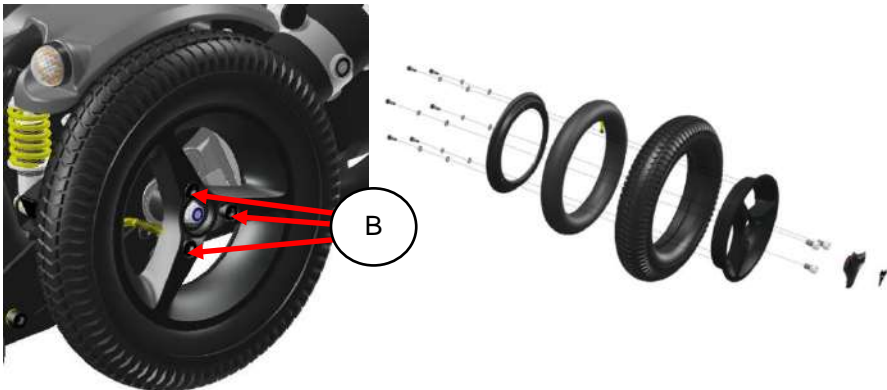
Type of tire	Tire size	Recommended pressure
Front tire	2.80/2.50-4	35 PSI, 2.4 Bar, 240 Kpa
Rear tire	3.00-8	50 PSI, 3.5 Bar, 350 Kpa

### WARNING

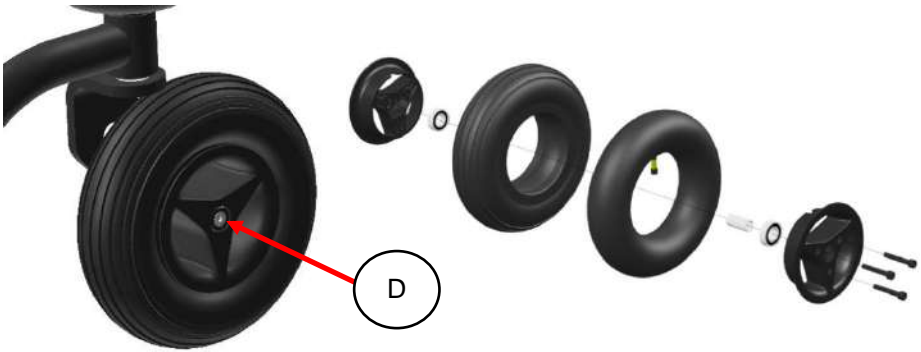
An incorrect tire pressure may result in lower stability and maneuverability. Too low tire pressure also results in abnormal wear and shorter driving range.

### 20.5.1 Puncture repair

Since the wheelchair is rather heavy, it is recommended to let your authorized supplier repair eventual tire punctures. First lift the wheelchair so that the punctured tire is free from the ground. Both front and rear wheel tires can be taken off by loosening the 3 bolts (B) or center bolt (D) which hold the wheels on to the wheelchair. **DO NOT LOOSEN THE CENTER BOLT.**



*Exploded view of (drive) wheel*



*The rear wheel can be taken off by loosening the center bolt*

After taking the wheels of the wheelchair the rim can be split. The tire is then available for repair. The inner tubes of the tires can be repaired according to the description on the tire puncture repair kit that you use. It is however recommended to renew the inner tube at all time when the tube has a puncture.

**i NOTE**

After re-assembling the wheel, you should mount the wheel onto the motor or rear fork and secure the bolts with blue loctite.

## **20.6 Cleaning**

Regular care and maintenance will prevent unnecessary wear and damage to your wheelchair. The following is general advice recommended by Karma. For severe soiling of the upholstery or damage to the surface finish, contact Karma or your local authorized supplier for information.

### **20.6.1 Upholstery, cloth / 3D mesh**

For normal cleaning, wash the upholstery with hand warm water and a mild nonabrasive soap. Use a soft cloth or brush. Before the surface dries, wipe off any water/soap residues with a clean, dry cloth. This procedure may be repeated to remove stubborn dirt or stains.

If necessary, the cover may be removed before cleaning. See also the washing instructions on the label of the upholstery materials.

### **20.6.2 Metal surfaces**

For normal cleaning it is best to use a soft cloth/sponge, hand warm water and a mild detergent. Wipe down carefully with a cloth and water and dry off. Remove scuff marks from semi-matt surfaces with soft wax (follow manufacturer's instructions).

Remove scuff marks and scratches from shiny surfaces using car polish, either liquid or paste. After polishing, apply soft car wax to restore the original surface gloss.

### 20.6.3 Plastic covers

For normal cleaning, wash plastic surfaces with a soft cloth, mild detergent and hand warm water. Rinse thoroughly and dry with a soft cloth. Do not use solvents or abrasive kitchen cleaners.

#### WARNING

Never use aggressive chemical cleaner or cleaning fluids. These will damage the surface and structure of the material.

#### WARNING

Never use a high-pressure water hose or steam cleaner. This will damage the surface and structure of the material and could cause electronic failure.

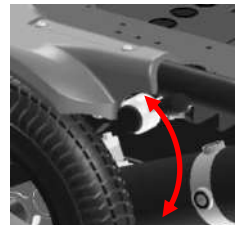
#### WARNING

Never use a sponge with a hard surface. This will damage the surface and structure of the material.

### 20.7 Brake release, freewheel mode

Check regularly, approximately once a month, that the brake release and the brake release lever is working properly.

When the brakes are released, it should not be possible to drive the wheelchair.



#### CAUTION

When the brakes are released or locked, there is resistance, please push the wheelchair forward and backward slightly. That is, the brakes can be released or locked more smoothly. Do not use brute force to operate the brake release lever to avoid damage of the wheelchair components.

## 20.8 Battery replacement

Karma strongly recommends that battery replacement and installation always be done by a qualified technician. To replace the batteries, please refer to the photos below of the batteries equipped on the Leon series, and follow the below instructions to remove and load the batteries. The weight of one battery could be more than 10 kg. Please handle it with care.



### 20.8.1. Replacing the batteries

Step 1: remove the two screws on the battery casing in the front of the wheelchair and lift it off.



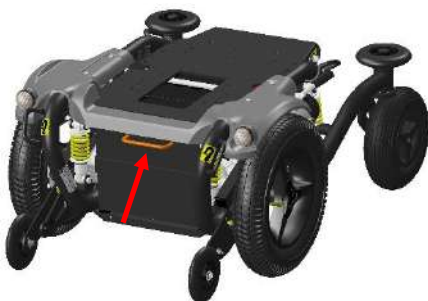
*Removing the cover bolts*

Step 2: remove the four battery box locking bolts at the rear end of the chassis side.



*Removing the locking bolts*

step 3: pull the battery box slowly out of the chassis, mind the cables.



*grabbing the grip*



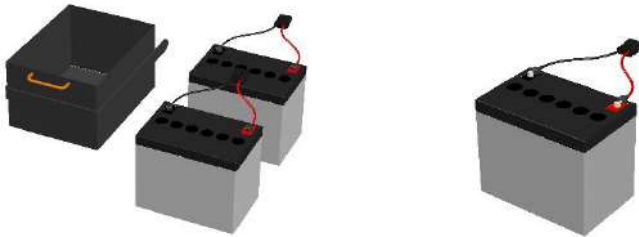
*pulling out the battery box*

step 4: unplug the battery cable connectors.



*Unplugging the cables*

step 5: lift the batteries out of the box and disconnect the cables of the poles using a wrench



*Lifting out the batteries    Disconnect the cable from the battery poles*

 **WARNING**

Although the batteries maybe broken, still be very careful when touching the battery connection poles. Avoid any risk of short circuit between both poles.

step 6: take the new batteries and place in the battery box.

step 7: connect the cables on to the poles.

step 8: place the battery box in front of the chassis.

step 9: connect the cables to the main power cable oif the chassis.

step 10: lift the battery box into the chassis and slide it slow into the chassis

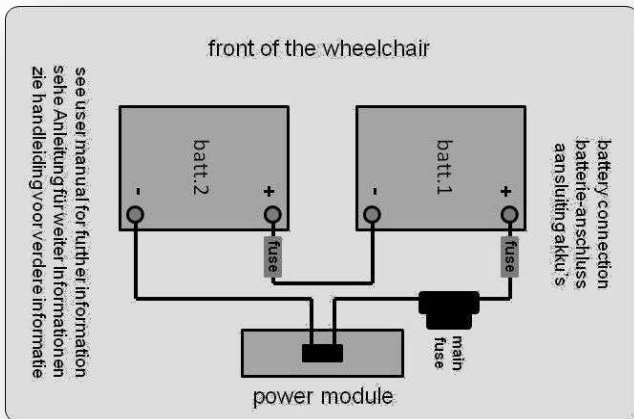


*Placing the battery box into chassis and slowly slide in inside*

step 11: fixate the battery box by attaching the four locking bolts at the rear of the chassis.



step 12: place the front cover back and secure it with the two bolts

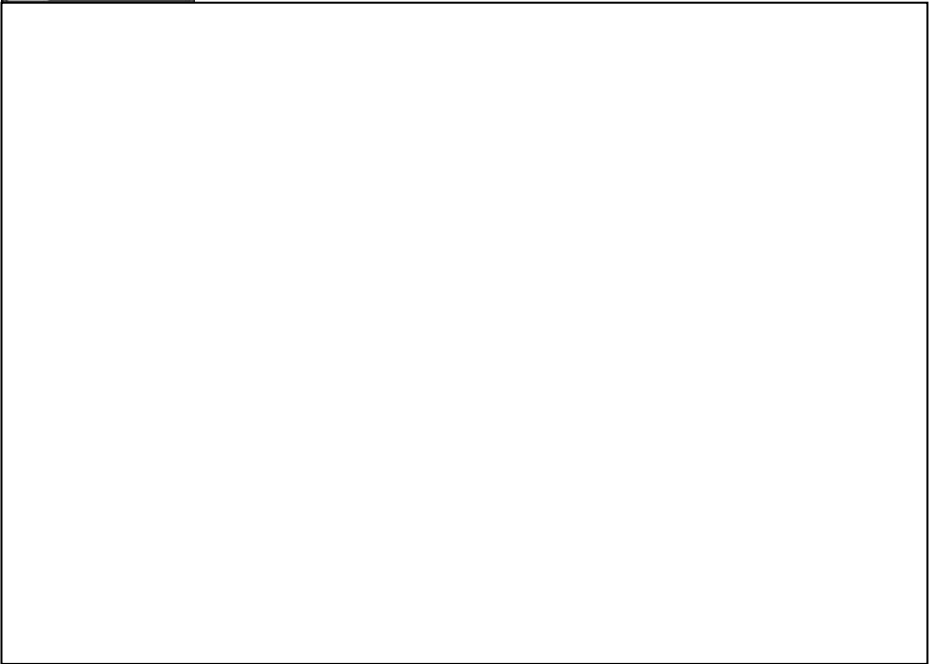


*Battery connection sticker*



## 20.8.2 Disposal of the batteries

### WARNING



### WARNING

If you have any question in the above procedures, if you are not capable of replacing the batteries by yourself or you don't feel comfortable doing it, please contact your local authorized supplier for help.

### WARNING

Damage on the wheelchair as a result of a not proper repair or replacement is not covered by our product warranty.

### WARNING

Batteries are classified as chemical waste and need to be disposed according to the local regulations for chemical waste.

## 21 Refurbishment and re-use of the product.

This wheelchair is suitable for refurbishment and re-use. This means that, if the wheelchair is not used anymore by the first user, it can be refurbished to fit another user. Should you not be able to use the wheelchair any longer, we strongly recommend you contact your local authorized supplier to have it picked up for refurbishment and re-use.

### WARNING

The refurbishment of the wheelchair is only allowed to be executed by an authorized supplier.

### WARNING

If the wheelchair is refurbished by a non-authorized supplier or institute, Karma Medical cannot be held responsible for this product, and all warranty claims will be voided.

### NOTE

The wheelchair will be refurbished according to a refurbishment guideline of Karma. This includes the replacement of all upholstery parts, a total disinfection of the product and a complete technical check of the wheelchair and its accessories.

## 22 Disposal of the product

In the case of disposal of the used wheelchair you need to follow the local legal regulations for disposals.

We strongly recommend you contact your local authorized supplier to take care of the disposal of your wheelchair.

### WARNING

Batteries are classified as chemical waste and need to be disposed according to the local regulations for chemical waste.

## 23 Trouble shooting

The following troubleshooting guide describes a number of faults and events which may occur when you use your wheelchair, together with suggested remedies. Note that this guide cannot describe all the problems and events which may occur, and you should always contact your local authorized supplier or Karma in case of doubt.

event	possible cause	remedy
the wheelchair does not start up	Batteries discharged.	charge the batteries
	The cable connection of the control panel has come loose	reconnect the cable
	main fuse is defect	replace main fuse CHECK FIRST!!! see page 69
wheelchair doesn't drive	charge still connected	disconnect charger
	brake release activated	de-activate brake release
	wheelchair locked	unlock the wheelchair
the wheelchair switches itself on after a certain while	the energy saving mode has been activated	restart wheelchair using the on/off button
the wheelchair stops whist being driven	a cable connection of the R-net system has come loose	check all R-net connections and restart
	main fuse has triggered	replace main fuse CHECK FIRST!!! see page 69
the wheelchair only drive at reduced speed	a speed reducing inhibit is activated	move the seat into a position where max. speed is allowed.
	Gyro has been disconnected	re-connect gyro NEED SERVICE!!
certain powered seat function is not displayed in menu	cable connection of seat function in disconnected	call for service
	seat function motor defect	call for service
wheelchair cannot be charged	main fuse disconnected	re-install main fuse
	main fuse has triggered	replace main fuse CHECK FIRST!!! see page 69
	connection between charger and joystick module not good	check connection  call for service

Note that this guide cannot describe all the problems and events which may occur, and you should always contact your local authorized supplier or Karma in case of doubt.

## 23.1 Diagnostics R-Net LCD

When an error or a fault occurs in the wheelchair's electronics, information on it is displayed in the control panel's display. This information can then be used to diagnose where the error/fault occurred and its cause.

Troubleshooting and repairs must always be performed by authorized personnel with good knowledge of the wheelchair's electronics.

### Diagnostic screens

When the control system's integrated protection circuits have been triggered so that the control system can no longer operate the wheelchair, a diagnostic screen is displayed in the control panel's display.



This indicates a system fault, i.e. R-net has detected a problem somewhere in the wheelchair's electrical system.

#### NOTE

If the fault is in a module that is not currently being used, it may still be possible to drive the wheelchair, but the diagnostic screen is displayed occasionally.

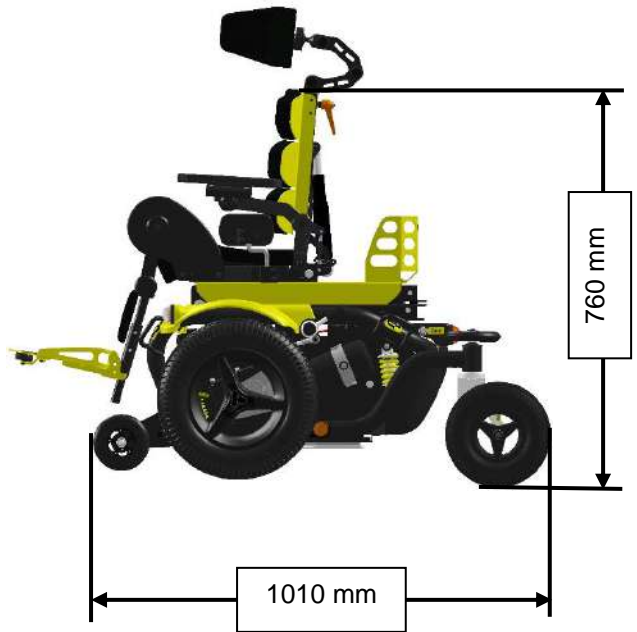
Switch off the wheelchair and leave it off for a few minutes. Then restart the wheelchair. If the fault persists, you must switch off the wheelchair and contact your service contacts. Write down the information displayed in plain text in the control panel's display and pass it on to your local authorized supplier's service contact.

#### WARNING

Diagnostics should only be performed by authorized persons with sound knowledge of the wheelchair's electronic control system. Incorrect or poorly performed repair works may make it dangerous to use the wheelchair. Karma accepts no liability for any personal injury or damage to the wheelchair and its surroundings that occurs because of incorrect or poorly performed repair work.

## 24 Technical specifications

Length [L]:	1010 mm (without legrest)
Width [W]:	620 mm
Height [H]:	760 mm (top backrest frame)



ISO Standard Measurement (ISO7176-5/ ISO7176-7/ ISO7176-15)		
Product Model	Leon F Kameleon	
Maximum user weight (kg)	57	
Driving Characteristics	Minimum	Maximum
Overall length with legrest (mm)	1090	1260
Overall width (mm)	620	-
Overall height (mm)	760	820
Folded length (mm)	1010	-
Folded width (mm)	620	-
Folded height (mm)	760	820
Total mass (kg)	167 (50Ah)	196 (80Ah)
Total mass without batteries (kg)	136	142
Mass of the heaviest part (kg)	116	-
Static stability downhill (X°)	11	
Static stability uphill (X°)	10	
Static stability sideways (X°)	16	
Dynamic stability uphill (X°)	6	
Ability to climb rated slope (X°)	12	
Maximum speed forward (km)	6	12
Energy consumption (km)	25.6 (50Ah)	46.2 (80Ah)
Braking method	Electromagnetic Brake	
Minimum braking distance from max speed (mm)	2000	-
Obstacle climbing (mm)	-	50
Minimum turning radius (mm)	660	-

Minimum turning radius without user (mm)	660	-		
Reversing width (mm)	845	-		
Ground clearance (mm)	60	-		
Front wheel size	3.00 - 8			
Rear wheel size	280/250 - 4			
Electrical System				
Motor power (W)	450			
Battery capacity (Ah)	50 x 2/ 80 x 2			
Charger output voltage (V)	24			
Charger output current (A)	5/ 8			
Battery Compartment (L x W x H) (mm)	345 x 260 x 220			
Seating System	SIZE 1		SIZE 2	
	Minimum	Maximum	Minimum	Maximum
Seat plane angle (X°)	(-3)	-	(-3)	-
Seat angle adjustment/ Power tilt (X°)	(-3)	42	(-3)	42
Effective seat depth (mm)	275	410	330	470
Effective seat width (mm)	250	300	350	400
Seat surface height at front edge (mm)	460	-	460	-
Seat height adjustment/ Power lift (mm)	460	760	460	760
Backrest angle (X°)	(-3)	-	(-3)	-
Backrest angle adjustment/ Manual recline (X°)	(-3)	48	(-3)	48
Backrest height (mm)	420	600	500	680
Leg to seat angle (X°)	89	-	89	-
Leg to seat angle adjustment/ Manual (X°)	89	172	89	172

Leg to seat angle adjustment/ Power (X°)	84	140	84	140
Footrest to seat distance (mm)	160	380	160	380
Armrest to seat distance (mm)	150	255	260	365
Front location of armrest structure (mm)	0	510	0	500

\* All the specifications specified in this section are estimated based on the following conditions: 20°C~35°C, an 60 kg occupant, brand new fully charged batteries and driving on the flat road.



\* If you want to know more about the measurement methods of wheelchair specifications, please scan the QR code to watch the instructions on the Karma website.

\* The actual product specifications differ from the data in the table by  $\pm 1$  cm  $\pm 0.5$  kg.

\* The actual product specifications may vary according to different configurations.

\* Karma reserves the right to modify information herein without further notice.

<b>Anatomic Measurement (The measurement is based on the body measurement)</b>				
Product Model	Leon F Kameleon			
Maximum user weight (kg)	57			
Seating System	SIZE 1		SIZE 2	
	Minimum	Maximum	Minimum	Maximum
Seat angle (X°)	(-3)	-	(-3)	-
Seat angle adjustment/ Power tilt (X°)	(-3)	42	(-3)	42
Nominal Seat depth (mm)	255	395	310	450
Nominal Seat width (mm)	250	300	350	400
Seat surface height (mm)	500	-	500	-
Seat height adjustment/ Power lift (mm)	500	800	500	800
Backrest angle (X°)	(-3)	-	(-3)	-



Backrest angle adjustment/ Manual recline (X°)	(-3)	48	(-3)	48
Seat to backrest angle (X°)	91	142	91	142
Backrest height (mm)	385	565	465	645
Leg to seat angle (X°)	89	-	89	-
Leg to seat angle adjustment/ Manual (X°)	89	172	89	172
Leg to seat angle adjustment/ Power (X°)	84	140	84	140
Footrest length (mm)	200	420	200	420
Armrest height (mm)	120	215	230	325
<p>* The actual product specifications differ from the data in the table by <math>\pm 1</math> cm <math>\pm 0.5</math> kg.</p> <p>* The actual product specifications may vary according to different configurations.</p> <p>* Karma reserves the right to modify information herein without further notice.</p>				

The wheelchair conforms to the following standards:

- a) requirements and test methods for static, impact and fatigue strengths (ISO 7176-8)
- b) power and control systems for electric wheelchairs – requirements / test methods (ISO 7176-14)
- c) climatic test accordance with ISO 7176-9
- d) requirements for resistance to ignition in accordance with ISO 7176-16
- e) crash test according to ISO 7176-19:2008

The rating of the wheelchair's accommodation of vehicle-anchored belt restraints based on the test methods of Annex D, Karma Leon F Kameleon: Overall rating: 14 points = A = good.

## **25 accessories**

Accessories for Karma power wheelchairs are subject to continuous development. Every day we design new accessories to improve the flexibility of our products.

Contact your local authorized Karma supplier for more information on the accessories which are available for your wheelchair.

Should you have a good suggestion for a new accessory, do not hesitate to contact us. Your idea might be the next new accessory!

## **World wide**

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NOTES:

## **We have a big dream**

Whether it's a customized wheelchair, standing chair, general purpose chair, or another mobility aid device, each of our products is carefully designed with our customers' voices, needs, and desires in mind.

When it comes to user experiences, we strive to be more "caring", "empathetic" and "approachable."

Through our dedication and our mindfulness, we look forward to bringing more confidence, joy, and love for life to those with physical abilities around the world.

*we look forward to bringing more confidence, joy, and love for life to those with physical abilities around the world.*

Karma Medical is continuously improving their products and accessories. Changes might take place without further notice.







# karma

A Better Wheelchair, A Better Fit



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