karma

User manual

Blazer Series

(KP-31.2 、KP-31.2T 、KP-31.2CPT)

A Better Wheelchair, A Better Fit

karma

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3. Declaration of conformity

karma A Better Wheelchair, A Better Fit

Document No.: DOC-Blazer-02

EU Declaration of Conformity

We, with the information specified in the below,

Our information as the manufacturer:

Manufacturer's Name:	KARMA MEDICAL PRODUCTS CO., LTD
Manufacturer's Address:	NO. 2363, Sec. 2, University Rd., Min-Hsiung Shiang, Chia-Yi County, 62144, Taiwan
SRN (Single Registration Number):	TW-MF-000013206

Our authorized representative:

Name:	KARMA MOBILITY, S.L.
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in accordance with

Regulation (EU) 2017/745 of the European Parliament and of the council Annex I, II, III, IV and IX

hereby declare that the medical device specified below:

Basic UDI-DI of Annex VI:	471987385KP-3LC
Device:	Electrically powered wheelchair
Trade Name or Mark:	Blazer series
Model Number:	Blazer-SLN(KP-31.2-SLN and KP-31.2-SLN-T) Blazer-CPT(KP-31.2-CPT)
Product Code according to EMDN:	Y122127
Product Code according to GMDN:	41877
Classification:	Rule 1 of Class I
UDI-DI:	04719873856688 04719873856695

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is in conformity with the applicable requirements of the following documents:

Ref. No.	Title	Edition date
ISO 13485	Medical devices - Quality management systems - Requirements for regulatory purposes	2016
ISO 14971	Medical devices - Application of risk management to medical devices	2019
EN 12182	Assistive products for persons with disability - General requirements and test methods	2012
EN 12184	Electrically powered wheelchairs, scooters and their chargers - Requirements and test methods	2014
EN 62366	Medical devices - Application of usability engineering to medical devices	2015
EN 60601-1	Medical electrical equipment - Part 1: General requirements for basic safety and essential performance	2006
EN ISO 10993-1	Biological evaluation of medical devices - Part 1: Evaluation and testing within a risk management process	2009
EN ISO 10993-5	Biological evaluation of medical devices — Part 5: Tests for in vitro cytotoxicity	2009
EN ISO 15223-1	Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General requirements	2016
MEDDEV. 2.7/1 Rev. 4	CLINICAL EVALUATION: A GUIDE FOR MANUFACTURERS	2016
MEDDEV 2.12/1 Rev. 8	GUIDELINES ON A MEDICAL DEVICES VIGILANCE SYSTEM	2013

The information on this declaration has been stated on the sole responsibility of KARMA MEDICAL PRODUCTS CO., LTD.

We hereby declare that the device named above has been designed to comply with the relevant sections of the above referenced specifications. The device complies with all General Safety and Performance Requirements.

Date of issue: 8th April 2022

Place of issue: NO. 2363, Sec. 2, University Rd., Min-Hsiung Shiang, Chia-Yi County, 62144, Taiwan

Richard Chang, CEO

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.

Before you use the Karma product, we strongly recommend you to 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 this manual. Karma reserves the right to make changes to the product without prior notice.

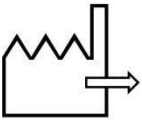
4.1 Chassis number

The chassis number is a very important number. Your wheelchair will be stored in our data system under this main number. You can find the number in between driving wheel and caster wheel.

The used symbols on the chassis plate are explained below:

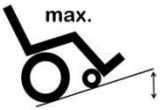
describes the model and type of the product.

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

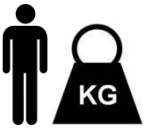


stands for the date of production.

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 a symbol. There are three levels of warnings:

1. Warning

⚠ 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

⚠ CAUTION

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

3. Note

ⓘ NOTE

If you see this symbol, we provide additional information which might be good to know. Please take notice of 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 Blazer 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 136 kg.
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.
The expected service life of the product is **five years**, presuming that the product is used daily in accordance with the safety operation instructions, inspection and maintenance instructions, and intended use, which described in this manual.

8. Intended environment

The product is not restricted to only indoor or only outdoor use. Because of the large wheels placed in the rear, the wheelchair 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 and the charger operate temperatures is 0 up to 40 degrees Celsius. It however 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 salt water 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 salt water as described in the paragraph “cleaning”.

9. Tyre pressure

The product uses air-filled tyres in the front 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 tire pressure is also shown on the stickers in the rims of the chassis. The tyre pressure should be:

Front air-filled tyres (small): max. 350 Kpa / 50.7 PSI / 3.5 bar

Rear air-filled tyres (large): max. 350 Kpa / 50.7 PSI / 3.5 bar

10. Wheelchair

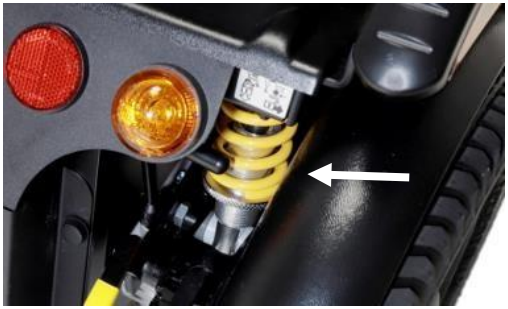
10.1 Chassis

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 drive wheels is propelled by a powerful drive motor. These motors also take care for the steering of the wheelchair.

10.1.1 Chassis suspension

The chassis has suspension on the drive wheels.



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 rear of the chassis.

⚠ WARNING

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

10.1.3 Transport fixation loops

Fixation loops in the front

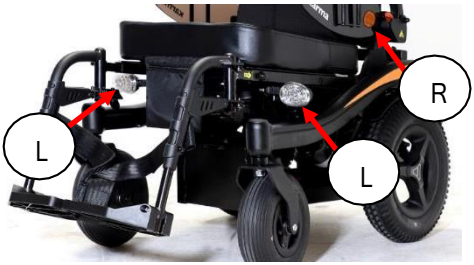
Fixation loops in the rear

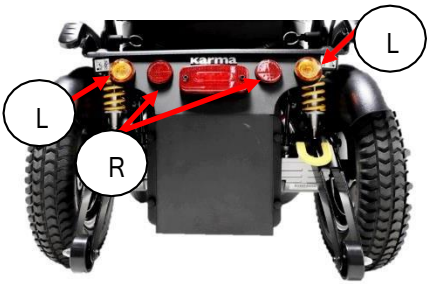
⚠ CAUTION

Please note that the transport loops are optional. If the wheelchair is not equipped with transport loops, it is prohibited to be transported on the vehicle.

The fixation loops are marked with this sign:
Further information about transportation of the wheelchair you will find in chapter "transportation".

10.1.4 Lights and reflectors (Optional)



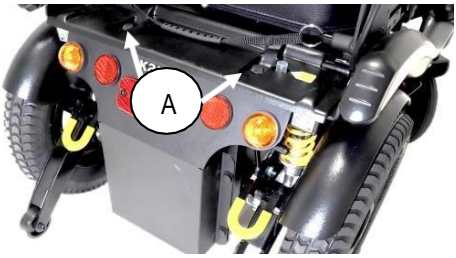


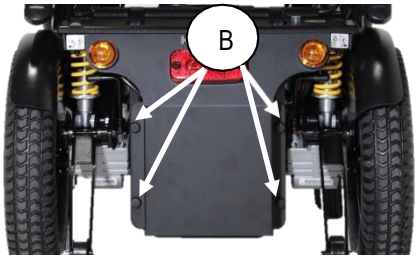
The chassis has very strong and bright LED lights to make sure you can have a safe drive in the dark. The optional orange reflectors and the red reflectors can also make you visible for other people as well. The lights fulfill the European requirements. The additional LED indicators give our environment clear information in which direction you want to go.

10.1.5 Battery compartments

The compartment can hold maintenance-free batteries up to 50Ah. For the specification of the batteries see the chapter technical specifications.

The maintenance-free batteries can be reached from the back. To reach the batteries, untighten 2 knobs (A) to take off the top-back cover. Then, untighten these 4 knobs (B) to take off back-rear cover.





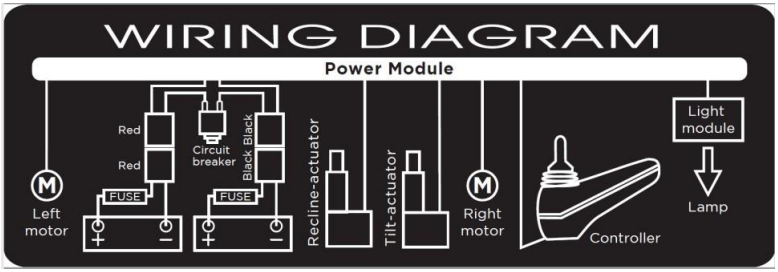
After taking the cover off, the maintenance free battery can be pulled out of the box. Mind the cables! At installing the maintenance free battery, one should pay great attention to make sure the cables are not jammed between the battery and the battery box.

⚠ CAUTION

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

⚠ CAUTION

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



Wiring instructions

10.1.6 Main fuse

The chassis contains a circuit breaker which is located at the rear of the chassis. The circuit breaker protects the whole electrical system of the wheelchair.

Circuit breaker location

This circuit breaker will pop-up when the electrical system is over-load. Once the breaker pops, you will not be able to control the wheelchair by joystick.

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, push down the circuit breaker. You will be able to drive again.

10.2 Seat

There are two different seating system used in Blazer Series, Sling Seat and Captain Seat. The choice is made by the user during the ordering of the wheelchair. Please identify firstly which one is mounted on your Blazer.

Sling Seat

The Sling Seat can be adjusted in seat depth, footrest hanger position, and seat-to-back angle. It can be up-graded into manual recline or power tilt. The seat pan is flat so other seating cushion can be fitted on to the seat as well.

Captain Seat

The Captain Seat offers manual recline function and can be adjusted in footrest hanger position.

10.2.1 Upholstered seat cushion

The **Sling Sea**t upholstered seat cushion is available in different sizes to provide optimal seating comfort and support to the user. The cloth is air mesh. The seat cushion is well fixed with Velcro on to the seat pan to prevent it from sliding. The **Captain Seat** surface is made with PU material.

10.2.2 Seat tilt (Sling Seat only)

The seat tilt in Blazer model can be used to release pressure. The tilting angle is from 6 to 28°. 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, always check if there are 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 influence on the driving characteristics of the wheelchair. Make sure there is enough space to drive.

10.2.3 Upholstered backrest

The **Sling Seat** upholstered backrest is available in different sizes to provide optimal seating comfort and support to the user. The cloth is breathable fabric. The backrest is well fixed with Velcro on to the backrest plate to prevent it from sliding. The **Captain Seat** surface is made with PU material.

10.2.4 Angle adjustable/ Manual recline backrest (Optional)

There are two different seating system used in Blazer Series, Sling Seat and Captain Seat. Please identify firstly which one is mounted on your Blazer.

Sling Seat angle adjustment

Manual Recline Add-on

The Sling Seat backrest angle can be set tool-free from 100°/ 105°/ 110°. With manual recline add-on, Sling Seat can recline from 90° to 121°.

Captain Seat

The Captain Seat offers manual recline backrest. It can be set tool-free from 90° to 146°. It gives the user the possibility to move into a laying position.

⚠ CAUTION

When reclining always check if there are no obstructions close to the wheelchair. Especially in the rear of the wheelchair.

⚠ CAUTION

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

10.2.5 Armrest

The armrest pads are adjustable in height and depth. For transferring in and out of the chair, the armrests can be flipped up. Simply pull the flip-back lever, the armrest can be flipped backwards.

Captain Seat

Sling Seat

10.2.6 Footrest

The footrest can be swung away and detached for transportation or storage. The footrest can be adjusted in length and in depth.

To swing away and detach the footrests, pull the swing-away lever, then you can swing away and/or detach the footrests. It makes transferring in and out of the wheelchair easier.

10.2.7 Headrest

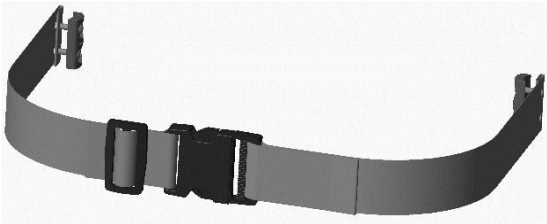
On the sling seat, the headrest is adjustable in height, depth and angle. On the captain seat, the headrest is adjustable in height.

NOTE

If the wheelchair user is transported in a taxi van we strongly advice to use the headrest. This is in order to provide you optimal stability whilst driving in the taxi.

10.2.8 Positioning belt (optional)

The positioning belt provides sitting safety and positioning for users.

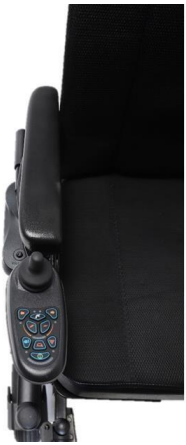


NOTE

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

10.3 Control

10.3.1 Side steering control

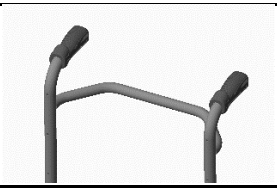


Side steering control

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 sit close to a table.

10.4 Other optional accessories

Item	Figure	Introduction
Handle Bar		The handle bar is to help user to stabilize upper body. It can be adapted after-sales.
Push Brake		The push brake parks the wheelchair when it is in the freewheel mode. It can be adapted after-sales.
Push Handle		Only for 460mm backrest height. The handle bar is friendly for attendant. It has to be pre-ordered before the shipment.
Wide Armpad		This armpad is longer than the standard armpad. Also, its one end is wider than the other end. Its dimension is 370mm*75mm (wider end) It can be adapted after-sales.
Elevating legrest		Legrest angle can be adjusted for better leg support. It can be adapted after-sales.
Tray Table		The tray table provides a platform for the user. It can be adapted after-sales.

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 set up for the user. An improper set up of the wheelchair might lead to uncontrolled driving which can result in personal or material damage.

11.1 Seat adjustments

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

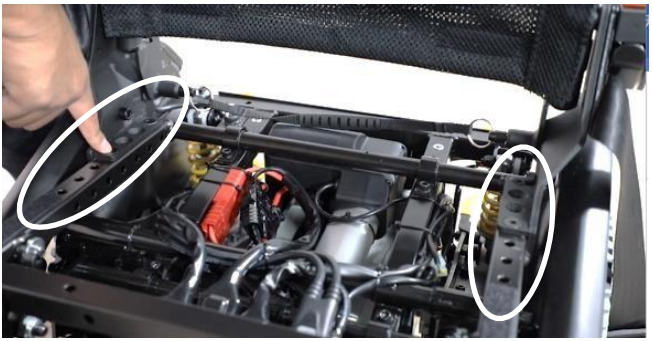
11.1.1 Seat depth

To adjust the seat depth, we have to do the following steps:

step 1. Take off the seat cushion

step 2. Use 4mm Allen key to unscrew the bolt connecting the seat plate. When taking off the seat plate, first tilt it up and then pull.

step 3. Untighten these 2 knob to take off the top-back cover.



step 4. Use 5mm Allen key to unscrew the bolts connecting the frame.

step5. Push the backrest frame to the preferred position. If the frame is tight, use rubber mallet to help.

step6. Mount the bolts connecting the frame and tighten them up.

step7. Secure back the seat pan, the rear-top cover, and the seat cushion.

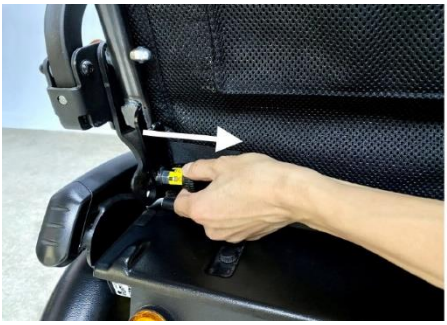
NOTE

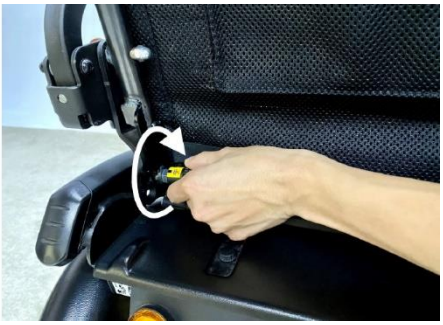
The setting of the seat depth requires some expertise. Therefore we strongly advise you to have it done by your local authorized Karma dealer.

Now the backrest is set in to a different depth position.

11.1.2 Backrest (seat-to-back) angle

To change the backrest angle on **Sling Seat**, first pull the knob on one side inward and turn it clockwise to lock. Then repeat the above procedure with the knob on the other side and push/ pull the backrest. There are 3 mounting holes for backrest angle at 100°/ 105°/ 110°. For Manual Recline function, please refers to manual recline chapter.

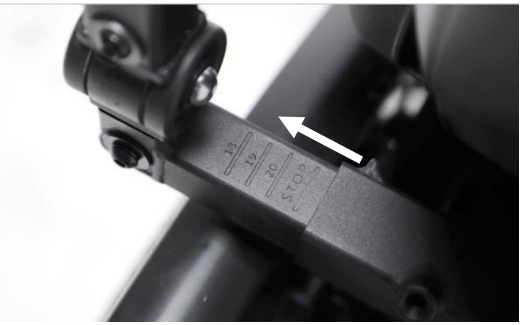




11.1.3 Armrest width

For Captain Seat, the distance between both armrests can be changed step-less. To change the distance, you must do the following steps:

step 1: Use 5mm Allen key to unscrew the screws securing the armrests.



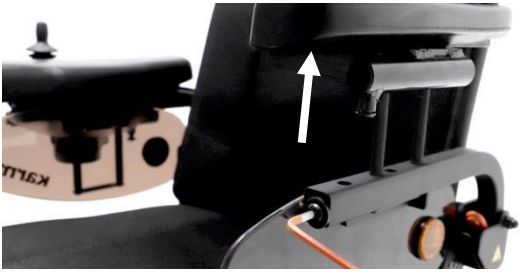
step 2: Pull the armrest tube out. You will see the scale and a stop indicator. Do not pull the armrest beyond the stop point.

Now the armrests are set in to a different width position.

11.1.4 Armrest height

The armrest height can be adjusted up and down independently. To set the right armrest height, follow the next steps:

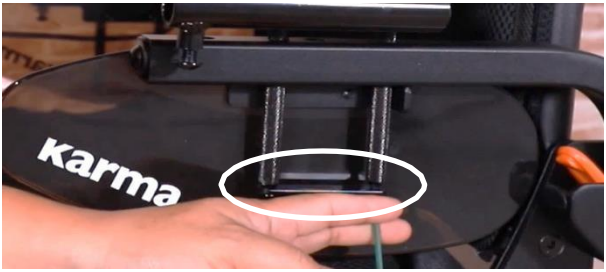
step 1: Use 5mm Allen Key from KARMA Tool Kit to loosen the height adjustment bolts under the armrest pad.



step 2: Adjust the armrest to the proper height and re-tighten the bolts.
Now the armrests are set in to a different height position.

11.1.5 Armrest depth

The armrest can be adjusted in depth. To set the right armrest depth follow the next steps:



step 1: Use 3mm Allen key to remove two screws shown above.

step 2: Use 5mm Allen key to remove the screw shown above.

Step 3: Take off the armrest assemble.

Step 4: Move the armrest assemble one step forward or backwards.

⚠ CAUTION

After adjusting the armrest, make sure the user can still access to the joystick. If the user need more adjustment regarding the relative position of the user's hand and joystick, please refer to the control setting chapter.

Now the armrests are set in to a different depth position.

11.1.6 Footrest longitudinal position

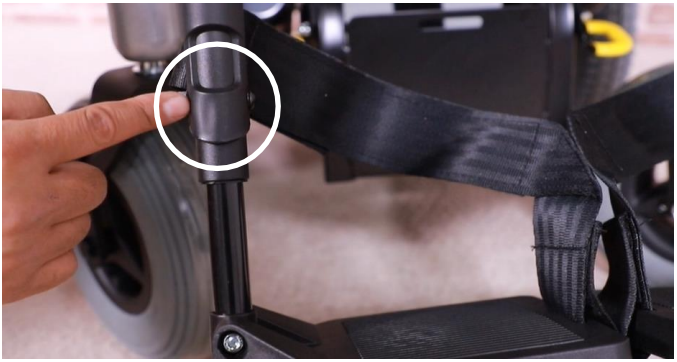
Step1: use 5mm Allen Key included in your KARMA Tool Kit to remove the screws under the seat.

Step2: Pull out or push in the footrest hanger and find the mounting hole that best fitted the user.

Now the footrests are set in to a different position.

11.1.7 Footrest Length

The footrest length should be adjusted according to the user's calf length.

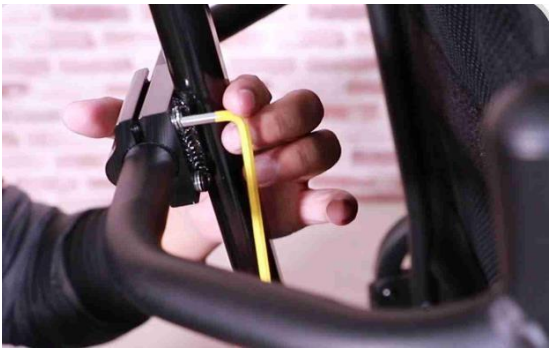


Use 10mm open wrench and 5mm Allen Key from KARMA Tool Kit to loosen the bolt at the side of the footplate and adjust the footplate height and re-tighten the bolt. Now the footplates are set in to a different position.

⚠ CAUTION

By loosening the second bolt on the footplate, the footplate might suddenly start to slide down. If the user has his or her foot on the footplate, this sudden movement might cause a shock reaction.
It is best to hold the footplate with one hand and loosen the bolt with the other hand.

11.1.8 Headrest setting for Sling Seat



step 1: Use 4mm Allen key to adjust the horizontal position from the bracket connecting the headrest to the frame.

step 2: Use 4mm Allen key to adjust the height from the headrest frame.

Step3: Use 5 mm Allen key to adjust the angle of the headrest.

11.1.9 Headrest setting for Captain Seat

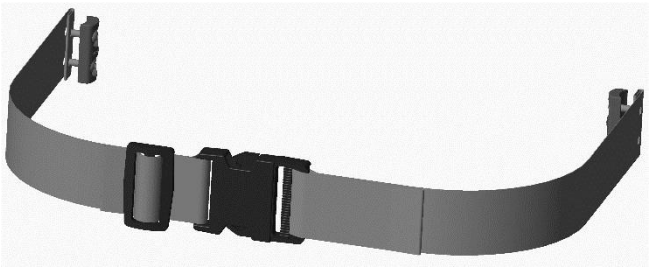
Adjust the height of the headrest from this button under the headrest.

⚠ CAUTION

If you loosen up the bolts too much, the headrest will fall down. This might cause a little shock reaction on the user in the wheelchair. It is better to loosen the bolts bit by bit and every time try to move the headrest. The friction will keep it stabile. Make sure you hold the headrest with one hand and loosen the bolt with the other hand.

11.2 Positioning belts

The optionally positioning belt can be adjusted in length. To change the setting simply operate from the tri-slide rim.



ⓘ 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.

11.3 Control settings

The side control joystick module is adjustable in depth and height.
To set the depth take the following steps:

11.3.1 Height adjustment side control

To set the height adjustment of the side control follow the next steps:

step 1: Use 3mm Allen key and 8mm open wrench to loosen up this bolt.
step 2: After confirming the position, re-tighten the screw.

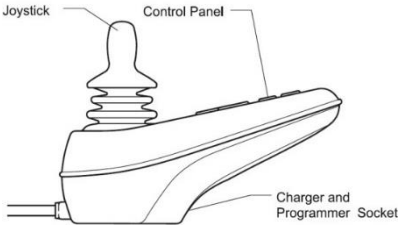
11.3.2 Depth adjustment side control

To set the depth adjustment of the side control follow the next steps:

step 1: Use 5mm Allen key to loosen up this bolt.
step 2: After confirming the position, re-tighten the screw.

12. Controller

All functions of the wheelchair can be controlled with this joystick module. This joystick module can be mounted on the left or right armrest. Joystick module contains a few major components which will be explained separately.



VR2 Controller

LiNX Controller

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.

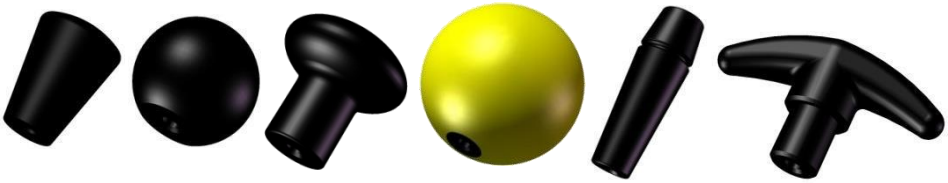
12.2 Joystick

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 the specific powered seat function. The joystick is 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. (Also refer to the driving technique chapter)

⚠ CAUTION

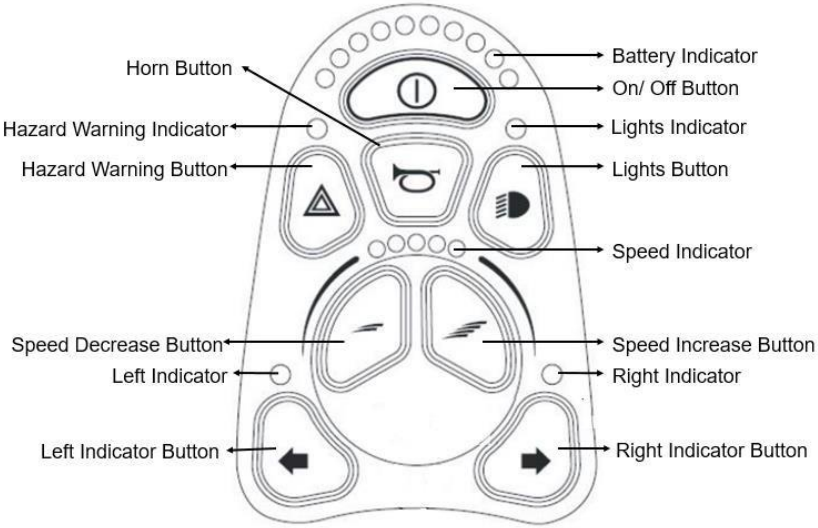
We strongly recommend practicing the function of the joystick before starting to drive with the wheelchair.

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

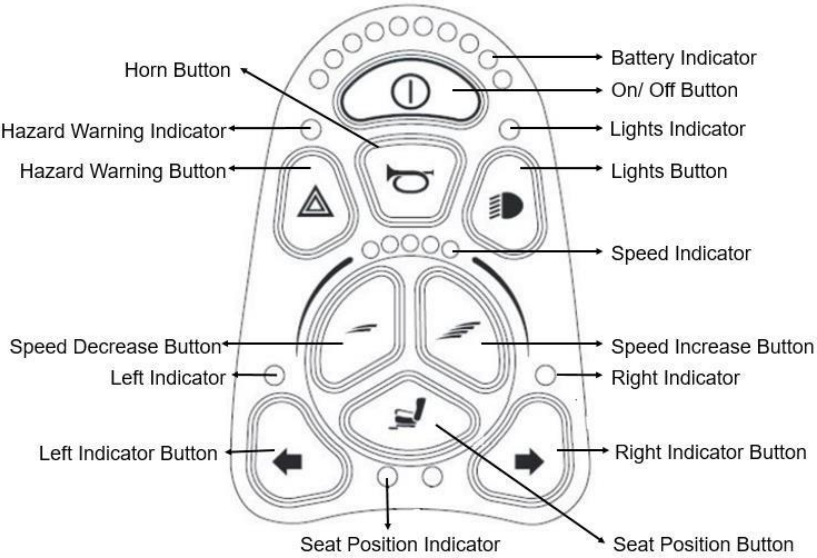


12.3 Control panel

- **VR2 Joystick Controller**



Control Panel with No Tilt & Lighting System



Control Panel with Tilt & Lighting System

- **LiNX Joystick Controller**

Control Panel with No Tilt

Control Panel with Tilt

Control Panel with No Tilt & Lighting System

Control Panel with Tilt & Lighting System

12.3.1 Battery indicator

Battery indicator displays the charge available in the battery and can be used to alert the user to the status of the battery. If all lights are on, the batteries are fully charged. If the capacity is lowered one by one, a light will erase. The bar is divided into three color zones: Green, orange and red. If only the red is left, it means the batteries will be almost empty and need to be charged.

12.3.2 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). When turning on, be sure not to touch the joystick. Your battery & diagnostics indicator should light up.

⚠ 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 that the joystick will be touched and the wheelchair will move.

12.3.3 Horn button

The horn will sound while this button is pressed.

12.3.4 Speed Indicator (VR2 Controller)

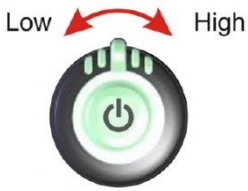
The speed indicator suggests how fast your wheelchair will be going when you move the joystick. The maximum speed is divided into 5 increment. The more lights that are on indicates the faster that you are driving.

12.3.5 Speed decrease/ increase button/ Speed dial

- **VR2 Joystick Controller**

The speed increase button increases the speed setting. (It does not increase the maximum speed!). The speed decrease button decreases the speed setting. The user can adjust the wheelchair's top speed to suit their preferences and environment.

- **LiNX Joystick Controller**



The speed dial allows the user to limit the maximum speed of the wheelchair to suit their preference and environment. The speed dial offers 10 discrete steps between the lowest speed and the highest speed.

12.3.6 Seat position indicator/ Drive/actuator status

When the indicator LED is on, it means the control unit is in the Position Mode, as oppose to Drive Mode. Which means, when you push or pull your joystick now, the control unit will activate the tilting function of your wheelchair.

- **VR2 Joystick Controller**

This indicator will be lit-on once the Seat position button is pressed.

- **LiNX Joystick Controller**

The seating function can be selected with the seating function select button. The selected seating function is displayed on the drive/ actuator status indicator.

12.3.7 Seat position button/ Seat function selector

This button shifts your joystick function from Drive Mode to Position Mode (tilting the seat up and back).

To tilt the wheelchair, press this button and pull the joystick towards the user until your preferred position. The maximum tilting angle is 28°. Moving the joystick away from the user will tilt the seat towards the upright position.

12.3.8 Hazard warning button

- **VR2 Joystick Controller**

This button activates and de-activates the wheelchair's hazard lights. Press the button to turn the hazards on and press 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.

- **LiNX Joystick Controller**

To switch on the hazard lights, press and quickly release the left-hand lighting button once. LEDs behind the left-hand button and right-hand button will flash on and off. To switch off the hazard lights, press the left-hand or right-hand lighting button.

12.3.9 Lights button

- **VR2 Joystick Controller**

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

- **LiNX Joystick Controller**

To switch on the Headlights/Taillights, press and quickly release the right-hand lighting button once. The LED behind the right-hand button will remain on. To switch off the Headlights/Taillights, press the right-hand or left-hand lighting button.

12.3.10 Left/ Right Indicator button

- **VR2 Joystick Controller**

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

- **LiNX Joystick Controller**

To switch on the left indicator, press and hold the left-hand lighting button once. The LED behind the left-hand button will flash on and off. To switch on

the right indicator, press and hold the right-hand lighting button once. The LED below the right-hand button will flash on and off.

12.3.11 Wheelchair lock

- **VR2 Joystick Controller**

The VR2 control system can be locked to prevent unauthorized use. The locking method is via a sequence of key presses and joystick movements, as detailed below.

To lock the wheelchair:

Step1. While the control system is switched on, press and hold the on/off button for more than 3 seconds. After one second the control system will beep. Release the on/off button.

Step2. Push the joystick forwards until the control system beeps.
Step3. Pull the joystick in reverse until the control system beeps.
Step4. Release the joystick, there will be a long beep. The wheelchair is now locked.

Use the on/off button to switch the control system on. The maximum speed / profile indicator will be rippling up and down.

To unlock the wheelchair:

Step1. Push the joystick forwards until the control system beeps.
Step2. Pull the joystick in reverse until the control system beeps.
Step3. Release the joystick, there will be a long beep.
Step4. The wheelchair is now unlocked.

- **LiNX Joystick Controller**

To lock the wheelchair:

Step1. Press and hold the power button for 4 seconds.

Step2. When entering the locked state, the battery gauge will indicate the transition by flashing LEDs 1, 3, and 5 (far left, middle, and far right) 3 times.

Step3. The wheelchair is now locked.

To unlock the wheelchair:

Step1. Press the power button once.

Step2. Then press the horn button twice.

Step3. The horn button must be pressed twice within 10 seconds of pressing the power button.

Step4. The wheelchair is now unlocked.

12.3.12 Joystick deflected error

If the wheelchair is started up and the joystick is not in its zero position, you will see 7 lights twinkling on the battery indicator session. Keep the joystick at its neutral (central) position and restart the on/off button. The system will start up normally and the error disappears.

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

⚠ 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.

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

- When the user is driving the wheelchair for the first time, the supplier has to make sure that the maximum driving speed and curving speed are set in a slow mode. After learning to drive the wheelchair safely, the set speeds can be increased.
- Special care should be taken in driving on unequal surfaces such as slopes, unequal pavements and during descending from footpaths.
- It is not allowed to carry passengers other than the user on the wheelchair.
- On slippery surfaces, like ice and snow, the driving speed must be reduced accordingly.
- Do not drive through water puddles, you cannot see how deep they are. This might lead to dangerous situations. Water can damage the wheelchair.
- Only charge the wheelchair in well ventilated areas.
- Note that no other persons or animals are in the direct contact zone of the wheelchair when using it. This is for both driving and using the high low. Because the wheelchair is a very powerful machine with a relative high weight this might lead to severe injuries.
- When driving the wheelchair in the dark, be sure that you have the lights switched on.
- Always drive slowly in the near surrounding of other people or animals.
- Although the wheelchair is intensively tested, it cannot be excluded completely that the wheelchair influences the performance of electromagnetic fields (e.g. Alarm systems of shops, automatic doors etc.).
- The driving characteristics of the wheelchair can be influenced by strong electromagnetic fields (e.g. Those emitted by portable telephones, electricity generators or high-power sources.) Try to avoid the near presence of any radiation source such as radios, 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.

14.2 Use in combination with other products

Different- or customized seat:

⚠ WARNING

- The combination of seat and user does not exceed the maximum allowed weight on the wheelchair carrier and tilt mechanism (136 kg).
- The seat is fixed properly to the seat post.
- The center of gravity of the combination of user and seat is on the same spot as when the standard seat would be used.
- The position of the tray table and/or the control unit is comfortable and easy to use for the user.
- The used materials are in compliance with the accepted standards mentioned in EN 12184 regarding flame resistance and bio-compatibility.
- The seat or any other mounted parts do not touch the wheelchair carrier when using the tilt function. This is because the dimensions will vary from the standard seat. This has to be checked by watching these parts when tilting the chair.

⚠ 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

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

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 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 tail 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, 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

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.

NOTE

When driving on downhill you can use the tilt (if build in)

WARNING

Never drive downhill on slopes bigger than 10°. 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

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

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.

NOTE

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

WARNING

Never drive uphill on slopes bigger than 10°. 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°)

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. Please note that the braking distance will increase on the slopes.

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 10°. 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°)

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 radios, 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 closeness where strong military transmitters are used. They might interfere with your wheelchairs electronics.

⚠ WARNING

Avoid area's closeness to high voltage power lines. They might interfere with your wheelchairs electronics.

⚠ WARNING

Avoid area's closeness to high frequency energy equipment, like high frequency welding machines. They might interfere with your wheelchairs 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. If you have electrical seat lift and tilt function, be aware of the risk of things getting caught in the machinery, 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 that 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. If you use R-net control, select the right profile (start with the indoor profile)

⚠ 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.

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 preferable to begin with a low speed.

4. Carefully move the joystick forward to drive forward, and backward to drive backward.

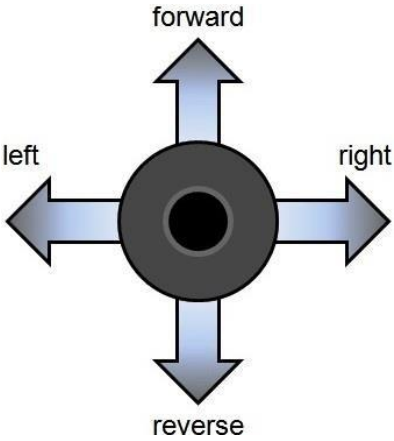
5. The speed of the wheelchair is adjusted continuously by the joystick being moved different distances forward and backward respectively. The wheelchair's electronics make creep driving possible over edges (max. 70mm.). You can drive up to the edge, and then carefully drive over it.

⚠ 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. If there an emergency and you need to make an emergency stop, pull the joystick backwards. This will slow down and stop the wheelchair very fast.

⚠ 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

16.1 Seat tilt

To tilt the chair, first turn on controller from On/Off button. Then, press the Seat Position button on your control panel. You will see the Seat Position indicator light up.

Pull the joystick towards the user

Now pull the joystick towards the user and the seat tilt will start to tilt backwards. As long as you pull the joystick backwards, the seat tilt will tilt backwards. Release the joystick and the seat tilt movement will stop. Push the joystick forward and the seat will tilt into forward position. The maximum tilting angle is 28°.

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.

NOTE

The default movement of deflection is set to backwards for tilting the seat backwards. Should you want to switch the axis direction of the joystick, please contact your authorized dealer to have the deflection set in the opposite direction.

16.2 Backrest Recline

To operate backrest recline on a **Sling Seat**, your wheelchair has to be equipped with manual recline add-on. If you do, simply push the lever at the back of the backrest to recline the backrest. The backrest angle can be changed step-less from 90° to 121°.

Push the recline lever on Sling Seat

To recline the **Captain Seat**, simply pull the lever on the right side of the seat and lean back. The backrest angle can be changed step-less from 90° to 146°.

Pull the recline lever on Captain Seat

17. Handling the mechanical brakes

The drive motors of the wheelchair have electro mechanical 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 lever at the side of the wheelchair. Turn the lever downward to release the mechanical brakes and turn it upward to engage the brake for driving mode. Around the lever is an instruction sticker which shows the direction to release or engage the mechanical brake.

⚠ WARNING

If you want to put the wheelchair into freewheel mode, be sure to switch the electronics off first. Leaving the electronics switched on will result in 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.

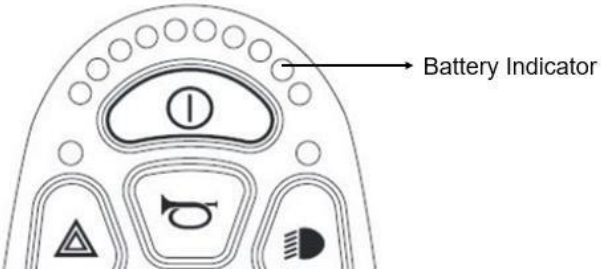
18. Charging the maintenance free batteries

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 you wheelchair shows these indications, please contact your local authorized supplier to have the maintenance free batteries checked.

18.1 Battery level

- **VR2 Joystick Controller**

The power level of the batteries is displayed on the controller panel of the joystick module.



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.

- **LiNX Joystick Controller**

The battery gauge comprises five different LEDs (1 x red, 2 x amber, 2 x green), situated above the remote module's horn button. The number of LEDs lit depends on the status of the battery. The battery gauge LEDs are also used to display charging information.

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

If only two LED are still on, it indicates that recharging of the maintenancefree batteries is required.

If only one LED's are still on, it indicates that the maintenance free batteries are empty and should be charged immediately.

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.

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.

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 is a save way. The wheelchair will stop.

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

The wheelchair can be delivered with a battery charger. The charger has a capacity to charge up to 5 amperes. This charger will fully charge the batteries within 10 hours. (Charger model: CTE 6A 4F24060 for 6 amperes, CTE 8A 4C24080A-CK84216000 for 8 amperes)

NOTE

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

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 place 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 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.

Fixation loops in the front

Fixation loops in the rear

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 al requirements according to the ISO 7176-19:2008 standard ("Wheeled mobility devices for use in motor vehicles).

NOTE

Karma Medical Taiwan would always recommend transferring to a car seat within a vehicle; however, should this not be possible, the following is the safest method:

a. The wheelchair must be positioned in a forward-facing position.

b. An Unwin restraint system like model Gemini 3 or a different brand with equivalent specification must be used.

c. As a car safety belt a Klippan Safety AB belt, model 907428 or a different brand with equivalent specification must be used.

d. The restraint system must be fixed on the specific points of the wheelchair, which show a label of a transportation hook.

e. A head restraint system must be fitted during transportation. This device must be suitably positioned and able to stay on during transportation.

f. The center point of gravity of the wheelchair during transportation should be as low as possible. A powered seat elevator must be in its drive position, the backrest should be upright, the seat should be in a horizontal position and the legrest should be positioned in a normal seating positions.

g. During transportation the wheelchair should be switched off to prevent it from moving by accidental joystick use.

h. Make sure the tire pressure of each wheel of the wheelchair is in the optimal condition. Too low tire pressure can result in an instable behavior of the wheelchair during transportation.

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.

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.

19.1.1 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 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 straps can have maximum effect. Make sure straps are tightened to keep 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

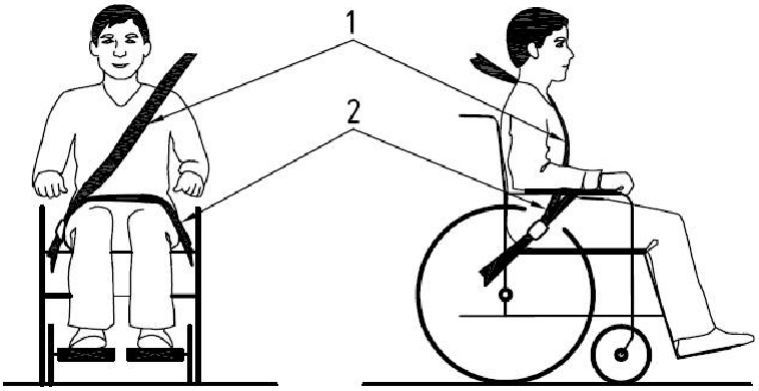
Alterations or substitutions should not be made to the wheelchair securement points or to structural- and frame parts or components without consulting the wheelchair manufacturer.

⚠ CAUTION

W Please note that the transport loops are optional. If the wheelchair is not equipped with transport loops, it is prohibited to be transported on the vehicle.

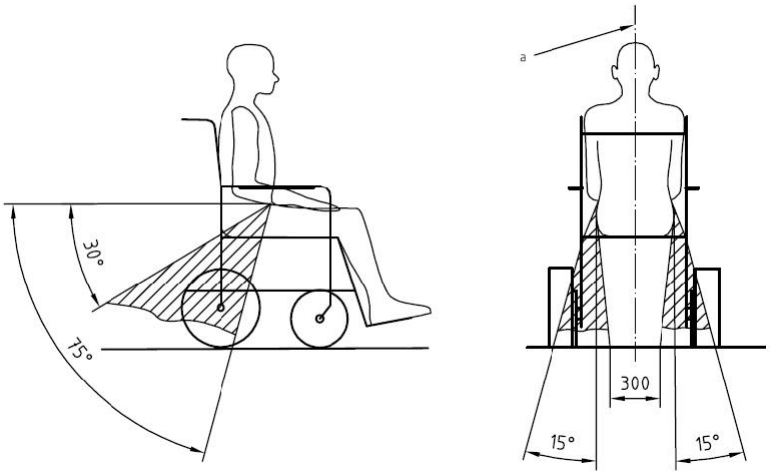
19.1.2 Safety belt

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



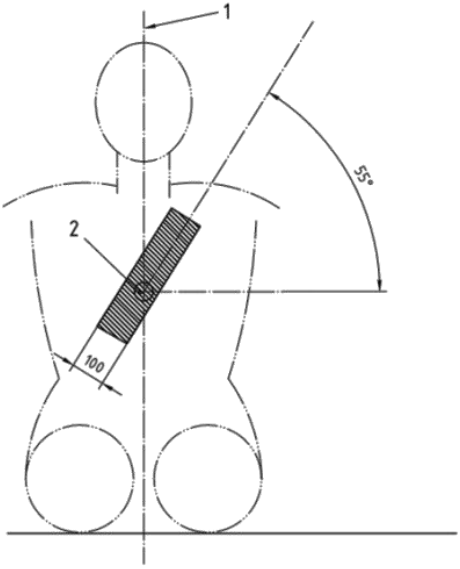
Positioning of the car safety belts for wheelchair users.

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

Please obtain the following points for an optimal personal safety of the wheelchair user:

- the pelvic belt should be worn low across the front of the pelvis, so that the angle of the pelvic belt is within the preferred zone of 30° to 75° to the horizontal, as shown in figure above.

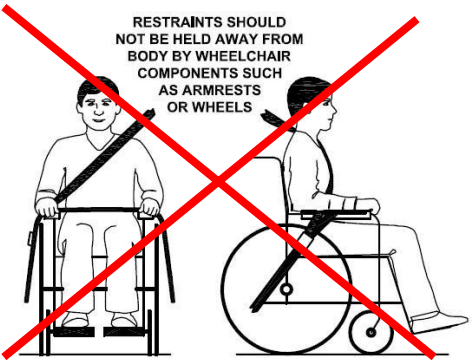
- a steeper (greater) angle within the preferred zone is desirable.

- belt restraints should not be held away from the body by wheelchair components or parts, such as the wheelchair armrests or wheels, along with an illustration similar to that of the figure shown above.

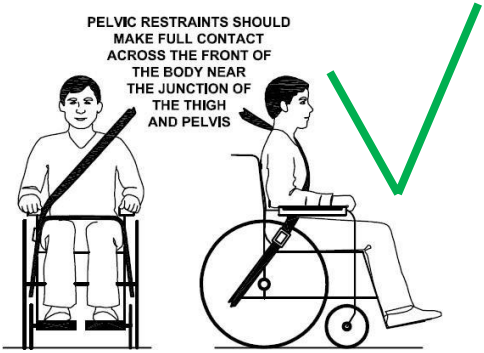
- upper torso belts should fit over the shoulder and across the chest, as illustrated in figure of the shoulder safety belt positioning.

- belt restraints should be adjusted as tightly as possible, consistent with user comfort.

- belt webbing should not be twisted when in use.



Picture of improper belt fit



Picture of proper belt fit

NOTE

- Please, make sure the following conditions are fulfilled to obtain a safe transportation:

- Whenever possible the occupied wheelchair shall be located in a forward-facing configuration and secured by the tie downs in accordance with the WTORS (wheelchair tie down and occupant-restraint system) manufacturer's instructions.

- This wheelchair is suitable for use in vehicles and has met the performance requirements for travelling forwards-facing in frontal impact conditions. Its use in other configurations within a vehicle has not been tested.

- The wheelchair has been dynamically tested in a forward-facing orientation with the ATD (anthropomorphic test device) restrained by both pelvic and upper torso belts.

- Both pelvic and upper torso belts should be used to reduce the possibility of head and chest impacts with vehicle components.

- When possible, other auxiliary wheelchair equipment should be either secured to the wheelchair or removed from the wheelchair and secured in the vehicle during transit, so that it does not break free and cause injury to vehicle occupants in the event of a collision.

- Positioning supports should not be relied on for occupant restraint in a moving vehicle unless they are labeled as being in accordance with the requirements specified in ISO 7176/19-2008.

- The wheelchair should be inspected by a manufacturer's representative before reuse following involvement in any type of vehicle impact.

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.

19.2 Transportation on an airplane

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

19.2.1 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 so, please refer to Battery Replacement chapter.

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.

19.2.2 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/weigh and vice versa. Always check with the airline what rules apply.

20. Maintenance and repairs

The user and attendant must 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.

Check the following items before driving. If you find anything abnormal, visit your KARMA wheelchair dealer for further inspection before using it.

Item	Inspection Content
Joystick Controller	- Is the joystick loose and/or making noise? - Can the joystick be turned left and right smoothly? - Can the speed buttons be adjusted freely and do they function well? - Does the wheelchair stop when the joystick is released completely? - Does it light up when the power is ON? - Is there enough power for your trip? - Does the horn work well?
Motor	- Is there any abnormal noise? - Does the electromagnetic brake work properly?
Freewheel Mode	- Do the freewheel levers work properly?
Driver's Seat	- Does the driver's seat recline? (if applicable) - Do the seat angle adjustment knobs(or buttons)work properly? - Does the surface of the seat remain or break?
Tires	- Are there any cracks or other damage to the tires? - Check the tire tread depth and air pressure.
Other	- Is there any abnormal motor noise? - Is there any abnormal LED lights of charger during charging? - Is there any damaged appearance of charger?

20.1 Regular Maintenance Record

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**. A maintenance/service fee may apply.

I - Inspection A - Adjustment Δ - Repair 3 - Replacement T - Tightening L - Add Oil

Item/Period		1 mth	6 mth	12 mth	18 mth	24 mth	30 mth
Joystick Control Unit			I	I	I	I/3	I/3
Power Module			I	I	I	I/3	I/3
Controller Buttons			I	I	I	I/3	I/3
Connection to the Electrical System				I		I	I/A
Motor	Operation and Noise		I	I	I/A	I/A	I/3
	Electromagnetic Brakes		I	I	I	I/3	I/3
	Connection to the Electrical System			I		I	
Batteries	Loose or Corroded Terminals			I		I	
	Connection to the Electrical System			I		I	
	Damage to the Electrical Cord/Cable			I		I	
Charger	Charging Function and LED Light	I	I	I	I/Δ	I/Δ	I/Δ
	Socket, Plug and Cords			I		I	
	Fan Functions Properly (if applicable)			I		I/Δ	
Driver's Seat	Recline Function			I/L		I/L	
Tires	Cracks/Surface Damage	I/3	I/3	I/3	I/3	I/3	I/3
	Tread Depth		I	I/3	I	I/3	I
	Abnormal Wear Pattern			I/3		I/3	
Wheel Rim	Tightness of Bolts and Nuts			T		T	
	Wear or Deformation Around Tires			I/3		I/3	

20.2 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.
- The charger may malfunction if it is dropped to the ground or damaged by external impact.
- If the charger has a damaged appearance or abnormal LED light, please contact a KARMA dealer.

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.

20.3 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.

20.4 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 to be 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

- Please note that a battery discharges itself and that a discharged battery can burst when it is cold. If the wheelchair is to be stored unused for an extended period, the batteries must always be charged once a month to avoid them being damaged.
- The wheelchair must not be stored in areas subject to condensation (steam or moisture on surfaces), for example utility rooms or similar.
- The wheelchair may be stored in an unheated room. From the point of view of corrosion, it is best for the room to be a few degrees warmer than the surroundings as this keeps the room drier.
- If the wheelchair is fitted with acid batteries, the acid level should be checked regularly. If the wheelchair is fitted with gel batteries, the liquid level does not need to be checked.
- The life of the batteries depends entirely on regular charging.

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.

20.5 Tools

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

NOTE

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

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.

20.6 Wheels and tires

Check at regular intervals that the wheelchair's tires have the correct tire pressure. We suggest to check the tire pressure at least every 4 weeks.

type of tire	tire size	recommend pressure	max. pressure
Front tire	2.80-2.50-4	43.5 PSI, 3 Bar, 300 Kpa	50.7 PSI, 3.5 Bar, 350 Kpa
Rear tire	3.00-8	43.5 PSI, 3 Bar, 300 Kpa	50.7 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 jack up the wheelchair so that the punctured tire is free from the ground. Both caster wheels and driving wheels tires can be taken off by loosening the bolts which hold the wheels on to the wheelchair. The driving wheels should be taken off from the motor hub by first taking away the cover plate (A) and then loosening the 3 bolts (B).

⚠ WARNING

Do not loosen the central hub bolt to remove the driving wheel.

After taking the wheels off 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.

Plastic Rim

Aluminum Rim

The caster wheels should be taken off from the axle by loosening the center bolt (A). Tire can be taken off by loosening the 3 bolts (B) and splitting the rim.

20.7 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 / air 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 sponge with a hard surface. This 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.

20.8 Brake release, freewheel mode

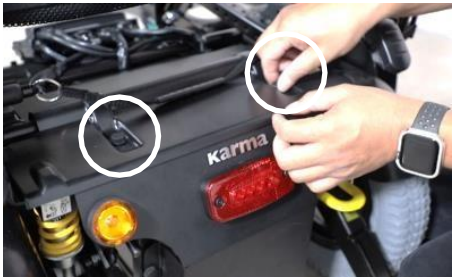
Check regularly, approximately once a month, that the brake release and the brake release lever is working properly. When the brakes are released, it should not be possible to drive the wheelchair by joystick.

Testing the brake release

20.9 Battery replacement

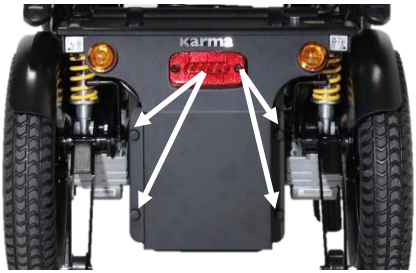
step 1: Place the wheelchair on a level surface.
step 2. Switch off the power supply using the ON/OFF key on the controller.
step 3. Pull the orange lever to swing away the armrest and then take off the seat cushion

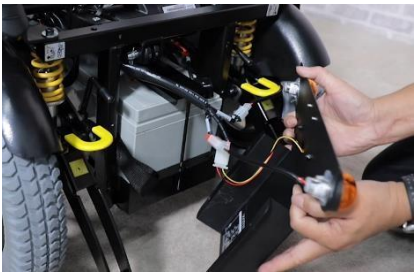
step 4. Use 4mm Allen key to unscrew the bolt connecting the seat plate to take off the seat plate. When taking off the seat plate, first tilt it up and then pull.



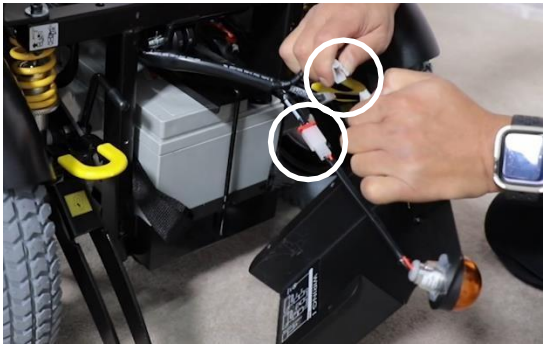
step 5. Untighten these 2 knob to take off the top-back cover.

step 6. After the top-back cover is off, you will see two power connector. One is red and one is black. Disconnect the power cables.



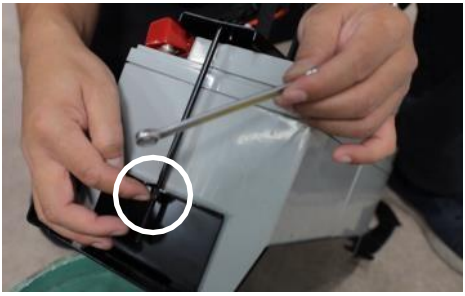


step 7. Untighten these 4 knobs on the both sides to take off back-rear cover.



step 8. Disconnect the two light cables

step 9. Use the rear and front strap to pull out the battery plate



step10. Use 8mm open wrench to loosen up this bolt.

step 11. Now, you can disconnect the battery and change it.

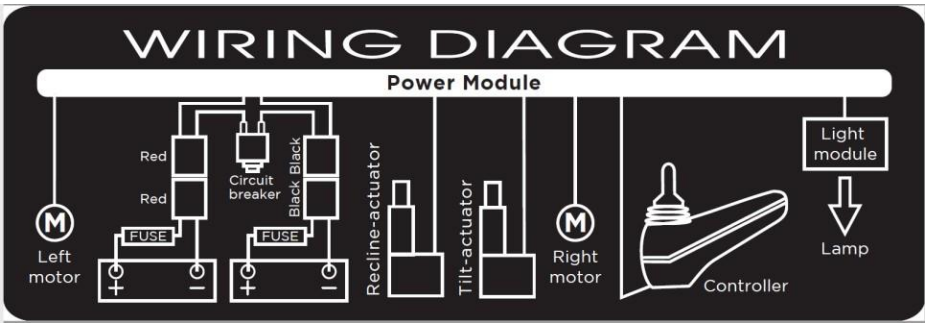
step12. The mounting battery assemble will take place in reverse order.

⚠ WARNING

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

⚠ WARNING

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



Battery connection sticker

⚠ WARNING

Damage on the wheelchair because 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
	Circuit break shorted	Re-set it by pushing the button.
wheelchair doesn't drive	charger still connected	disconnect charger
	Chair is in free-wheel mode	See break release, free-wheel mode chapter
	wheelchair locked	See unlock the wheelchair chapter
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 controller has come loose	check all connections and restart
certain powered seat function is not working	cable connection of seat function in disconnected	call for service
	seat function motor defect	call for service
wheelchair cannot be charged	connection between charger and joystick module not good	check connection call for service

Note that this guide cannot describe all the problems may occur and you should always contact your local authorized supplier or Karma when doubt.

23.1 Diagnostics VR2 & LiNX

When an error or a fault occurs in the wheelchair's electronics, the battery indicator will blink on and off for technicians to diagnose where the error/fault occurred and its cause. Diagnostics should only be performed by authorized persons with sound knowledge of the wheelchair's electronic control system.

⚠ WARNING

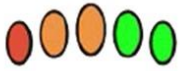
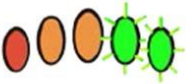
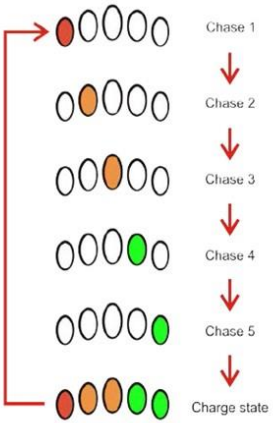
Incorrect or poorly performed repair works may make it dangerous to use the wheelchair. Karma accepts no liability for any personal injury or damage to the wheelchair and its surroundings that occurs because incorrect or poorly performed repair work.

- **VR2 Joystick Controller**

Indication	Status	Meaning	What to Do
	1 signal	The battery needs charging or there is a bad connection to the battery.	Check the connections to the battery. If the connections are good, try charging the battery.
	2 signals	The left hand motor has a bad connection.	Check the connections to the left hand motor.
	3 signals	The left hand motor has a short circuit to a battery connection.	Connect your service agent.
	4 signals	The right hand motor has a bad connection.	Check the connections to the left hand motor.
	5 signals	The left hand motor has a short circuit to a battery connection.	Connect your service agent.
	6 signals	The wheelchair is being prevented from driving by an external signal.	Please remove the charger.
	7 signals	A joystick fault is indicated.	Make sure that the joystick is in the center position.
	8 signals	A joystick fault is indicated.	Make sure that all connections are secure.
	9 signals	The parking brakes have a bad connection.	Check the parking brake and motor connections and make sure all connections are secure.
	10 signals	An excessive voltage has been applied to the control system.	Check the battery connections.
	7 signals + S	A communication fault is indicated.	Make sure that joystick cable is securely connected and not damaged
	8 signals + A	An actuator trip is indicated.	If more than one actuator is fitted check which actuator is not working correctly. Check the actuator wiring.

- **LiNX Joystick Controller**

Flash code		Error description	Possible action
1		Remote joystick error	Check cables and connectors Replace the Remote
2		Network or configuration error	Check cables and connectors Recharge the battery Check charger Replace modules Contact the dealer
3		Left motor error	Check cables and connectors Replace Power Module Check and/or replace left motor
4		Right motor error	Check cables and connectors Replace Power Module Check and/or replace right motor
5		Left park brake error	Check cables and connectors Check left park brake is released Replace modules
6		Right park brake error	Check cables and connectors Check right park brake is released Replace modules
7		Module error (other than Remote)	Check cables and connectors Check modules Replace LiNX Access Key Power Module Recharge battery If the chair stalled, reverse away the chair or remove any obstacles. If the chair was moved while turned off, please wait for a few seconds and switch on the power again.

The battery gauge LEDs	Information
	Batt Gauge Maximum is indicated on the battery gauge with all LEDs lit and signifies that the battery level is somewhere between 81 and 100% of full capacity.
Batt Gauge Maximum	
	A low battery warning is generated when the battery voltage falls below the Batt Gauge Low Voltage Warning set-point. This is indicated on the battery gauge with the red (left-most) LED flashing.
Batt Gauge Low Voltage Warning	
	A high battery warning is generated when the battery voltage goes above the Batt Gauge High Voltage Warning set-point. This is indicated on the battery gauge with all LEDs lit, and the two green (right-most) LEDs flashing.
Batt Gauge High Voltage Warning	
	The Battery Gauge will indicate the system is being charged by cycling between a left-to-right chase sequence, and then displaying the approximate battery charge state at the end of the chase sequence.
Battery charging	

24. Technical specifications

Product Model	KP-31.2		
Nominal seat width (mm/in)*	420 / 17	475 / 19	505 / 20
Nominal seat depth (mm/in)**	425 ~ 500 / 17 ~ 20	425 ~ 500 / 17 ~ 20	425 ~ 500 / 17 ~ 20
Front caster / Drive wheel size (in)	9 / 14	9 / 14	9 / 14
Backrest height without cushion (mm)	530	530	530
Backrest height with cushion (mm)	460	460	460
Headrest height above seat (mm)	N/A	N/A	N/A
Armrest to seat distance without cushion (mm)	275 ~ 355	275 ~ 355	275 ~ 355
Armrest to seat distance with cushion (mm)	180 ~ 260	180 ~ 260	180 ~ 260
Front location of armrest structure (mm)	285 ~ 575	285 ~ 575	285 ~ 575
Seat surface height at front edge without cushion (mm)	445	445	445
Seat surface height at front edge with cushion (mm)	540	540	540
Footrest to seat distance without cushion (mm)	275 ~ 360	275 ~ 360	275 ~ 360
Footrest to seat distance with cushion (mm)	375 ~ 460	375 ~ 460	375 ~ 460
Effective seat width (mm)	420	475	505
Effective seat depth (mm)	380 ~ 540	380 ~ 540	380 ~ 540
Seat plane angle (X°)	8	8	8
Backrest angle (X°)	10 / 15 / 20	10 / 15 / 20	10 / 15 / 20
Seat to backrest angle (X°)	92 / 97 / 102	92 / 97 / 102	92 / 97 / 102
Leg to seat angle (X°)	105	105	105
Overall length with legrest (mm)	1090 ~ 1160	1090 ~ 1160	1090 ~ 1160
Overall width (mm)	580	600	635
Overall height (mm)	975	975	975
Folded length (mm)	830	830	830
Folded width (mm)	580	600	635
Folded height (mm)	815	815	815
Total mass (kg)	98.5	98.5	98.5
Total mass without batteries (kg)	67.2	67.2	67.2
Mass of the heaviest part (kg)	63.0	63.0	63.0

Maximum user weight (kg)	136	136	136
Motor power (W)	350	350	350
Battery capacity (Ah)	50*2	50*2	50*2
Charger output current (A)	6	6	6
Drive range (km)***	26	26	26
Battery Compartment (L x W x H) (mm)	505 x 175 x 200	505 x 175 x 200	505 x 175 x 200
Maximum speed forward (km)	10	10	10
Minimum braking distance from max speed (mm)	2100	2100	2100
Obstacle climbing (mm)	50	50	50
Ground clearance (mm)	73	73	73
Minimum turning radius (mm)	1020	1020	1020
Minimum turning radius without user (mm)	825	825	825
Reversing width (mm)	1250	1250	1250
Static stability downhill (X°)	9	9	9
Static stability uphill (X°)	9	9	9
Static stability sideways (X°)	9	9	9
Dynamic stability uphill (X°)	6	6	6
Ability to climb rated slope (X°)***	12	12	12

* **Nominal seat width** is measured the width of seat cushion at 120mm in front of the backrest. This value is mainly used in the product ordering process.

** **Nominal seat depth** is measured from the front end of the seat cushion to the back cushion. This value is mainly used in the product ordering process.

*** **Drive range/ Ability to climb rated slope** are estimated based on the following conditions: 20℃~35℃, 136 kg occupant, brand new fully charged batteries and driving on the flat road.

- The actual product specifications differ from the data in the table by ±1 cm ±0.5 kg.
- The actual product specifications may vary according to different configurations.
- Karma reserves the right to modify information herein without further notice.
- 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.

Product Model	KP-31.2T		
Nominal seat width (mm/in)*	420 / 17	475 / 19	505 / 20
Nominal seat depth (mm/in)**	425 ~ 500 / 17 ~ 20	425 ~ 500 / 17 ~ 20	425 ~ 500 / 17 ~ 20
Front caster / Drive wheel size (in)	9 / 14	9 / 14	9 / 14
Backrest height without cushion (mm)	530	530	530
Backrest height with cushion (mm)	460	460	460
Headrest height above seat (mm)	570 ~ 695	570 ~ 695	570 ~ 695
Armrest to seat distance without cushion (mm)	275 ~ 355	275 ~ 355	275 ~ 355
Armrest to seat distance with cushion (mm)	180 ~ 260	180 ~ 260	180 ~ 260
Front location of armrest structure (mm)	285 ~ 575	285 ~ 575	285 ~ 575
Seat surface height at front edge without cushion (mm)	445	445	445
Seat surface height at front edge with cushion (mm)	540	540	540
Footrest to seat distance without cushion (mm)	275 ~ 360	275 ~ 360	275 ~ 360
Footrest to seat distance with cushion (mm)	375 ~ 460	375 ~ 460	375 ~ 460
Effective seat width (mm)	420	475	505
Effective seat depth (mm)	380 ~ 540	380 ~ 540	380 ~ 540
Seat plane angle (X°)	8 ~ 28	8 ~ 28	8 ~ 28
Backrest angle (X°)	0 ~ 31	0 ~ 31	0 ~ 31
Seat to backrest angle (X°)	0 ~ 114	0 ~ 114	0 ~ 114
Leg to seat angle (X°)	105	105	105
Overall length with legrest (mm)	1090 ~ 1160	1090 ~ 1160	1090 ~ 1160
Overall width (mm)	580	600	635
Overall height (mm)	1165	1165	1165
Folded length (mm)	830	830	830
Folded width (mm)	580	600	635
Folded height (mm)	815	815	815
Total mass (kg)	103	103	103
Total mass without batteries (kg)	72.4	72.4	72.4
Mass of the heaviest part (kg)	66.5	66.5	66.5
Maximum user weight (kg)	136	136	136
Motor power (W)	350	350	350

Battery capacity (Ah)	50*2	50*2	50*2
Charger output current (A)	6	6	6
Drive range (km)***	26	26	26
Battery Compartment (L x W x H) (mm)	505 x 175 x 200	505 x 175 x 200	505 x 175 x 200
Maximum speed forward (km)	10	10	10
Minimum braking distance from max speed (mm)	2100	2100	2100
Obstacle climbing (mm)	50	50	50
Ground clearance (mm)	73	73	73
Minimum turning radius (mm)	1020	1020	1020
Minimum turning radius without user (mm)	825	825	825
Reversing width (mm)	1250	1250	1250
Static stability downhill (X°)	9	9	9
Static stability uphill (X°)	9	9	9
Static stability sideways (X°)	9	9	9
Dynamic stability uphill (X°)	6	6	6
Ability to climb rated slope (X°)***	12	12	12

* **Nominal seat width** is measured the width of seat cushion at 120mm in front of the backrest. This value is mainly used in the product ordering process.

** **Nominal seat depth** is measured from the front end of the seat cushion to the back cushion. This value is mainly used in the product ordering process.

*** **Drive range/ Ability to climb rated slope** are estimated based on the following conditions: 20℃~35℃, 136 kg occupant, brand new fully charged batteries and driving on the flat road.

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- 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.

Product Model	KP-31.2CPT	
Nominal seat width (mm/in)*	450 / 18	475 / 20
Nominal seat depth (mm/in)**	440 / 18	490 / 20
Front caster / Drive wheel size (in)	9 / 14	9 / 14
Backrest height (mm)	535	535
Headrest height above seat (mm)	605 ~ 680	655 ~ 700
Armrest to seat distance (mm)	180 ~ 280	175 ~ 270
Front location of armrest structure (mm)	230 ~ 645	230 ~ 645
Seat surface height at front edge (mm)	565	555
Footrest to seat distance (mm)	415 ~ 535	390 ~ 530
Effective seat width (mm)	470	500
Effective seat depth (mm)	420 ~ 500	490 ~ 570
Seat plane angle (X°)	11	7
Backrest angle (X°)	0 ~ 56	0 ~ 47
Seat to backrest angle (X°)	0 ~ 134	0 ~ 131
Leg to seat angle (X°)	100	105
Overall length with legrest (mm)	1060 ~ 1130	1060 ~ 1130
Overall width (mm)	600	625
Overall height (mm)	1210	1260
Folded length (mm)	855	855
Folded width (mm)	600	625
Folded height (mm)	810	810
Total mass (kg)	108	108.5
Total mass without batteries (kg)	77.4	77.9
Mass of the heaviest part (kg)	70.0	70.5
Maximum user weight (kg)	136	136
Motor power (W)	350	350
Battery capacity (Ah)	50*2	50*2
Charger output current (A)	6	6
Drive range (km)***	26	26
Battery Compartment (L x W x H) (mm)	505 x 175 x 200	505 x 175 x 200
Maximum speed forward (km)	10	10
Minimum braking distance from max speed (mm)	2100	2100
Obstacle climbing (mm)	50	50
Ground clearance (mm)	73	73

Minimum turning radius (mm)	1020	1020
Minimum turning radius without user (mm)	825	825
Reversing width (mm)	1250	1250
Static stability downhill (X°)	9	9
Static stability uphill (X°)	9	9
Static stability sideways (X°)	9	9
Dynamic stability uphill (X°)	6	6
Ability to climb rated slope (X°)***	12	12

* **Nominal seat width** is measured the width of seat cushion at 120mm in front of the backrest. This value is mainly used in the product ordering process.

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- 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 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

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!

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