

User Manual

LEVO C³



Please read these User Instructions carefully before operating your wheelchair! Failure to follow these instructions can result in serious personal injury and/or damage to the wheelchair! This is a type-approved medical device. Alterations to the construction or electronics will void the warranty and the product liability.

In case of difficulty please contact:

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IMPORTANT!

Contact your dealer, distributor or LEVO AG if you have a visual impairment.

LEVO strongly recommends that wheelchair users

a) fully acquaint themselves with the instructions for their device

b) always have access to 3rd-party assistance in case of emergency.

1. General Information for Stand-up Wheelchairs

Dear **LEVO** Customer

We would like to thank you for putting your trust in **LEVO AG**.

As well as performing all the functions of a sitting wheelchair, the **LEVO** enables you to stand up on your own. **LEVO** manufactures only wheelchairs with stand-up option.

Please read this manual carefully before using your **LEVO**. It contains important information necessary for the successful operation of your wheelchair.

It is possible that achieving the standing position may load the body in a way that it is perhaps not used to. Therefore, it is **necessary to consult with your doctor or physical therapist to confirm that there are no contraindications such as contractures, orthostatic hypotension, osteoporosis or other conditions present.**

In the case of strong or sudden spasms, cramps or similar conditions, it is necessary that the user is allowed to stand only under the supervision of an accompanying attendant or caregiver.

As a **LEVO** customer, you have the opportunity to make a valuable contribution with the on-going future development of our products. Your suggestions are always appreciated. This will insure that **LEVO** continues to offer the most functional products available and provides for the widest possible range of needs.

Yours faithfully,

LEVO AG

EU SRN: CH-MF-000008751

The EU Authorized Representative for the MDR (EU) 2017/745 is:
be-on-Market GmbH, Lilienstrasse 33, D-91244 Reichenschwand.

EU SRN: DE-AR-000006148

2. Introduction

Thank you for choosing the **LEVO C³**.

The **LEVO C³** is designed as a powered stand-up wheelchair for indoor and outdoor use. As such it belongs to the wheelchair category B.

The **LEVO C³** makes it possible to stand-up and to drive in a standing as well as in a sitting position. This function provides great independence to the user.

This wheelchair is made for everyone whose muscles do not allow them to propel a wheelchair manually. The **LEVO C³** is a unique aid for those facing difficulties in standing and walking.

The **LEVO C³** has been designed for older children and adults who will benefit from motorised mobility and the ability to stand up at will.

The standard model of the **LEVO C³** allows comfortable sitting and standing at every stage between the sitting and the full-standing position. Driving is possible in the sitting and the full-standing position and in all interim positions.

The front wheels are permanently powered with the same speed as the middle wheels, which offers a great maneuverability around ramps, obstacles and uneven ground (4WD). In sitting configuration, the chair is driven by the middle wheels and the front wheels automatically lift off the floor which allows a very small turning circle. In standing configuration, the chair is driven by the front wheels and the middle wheels lift off the floor. This allows also a great mobility in standing position. In sitting or standing position, the driven wheels are directly in the centerline of the body.

The seat depth, the armrests and the knee support are adjustable in increments of approximately 2cm which allows the chair to be ideally adjusted to customers' needs.

The maximum load is 140 kilograms or 310 pounds including personal and other belongings.

Read the safety instructions first, to acquaint yourself with the risks and dangers that can occur by the use of the wheelchair.

The **LEVO C³** is labelled with the **CE** -mark. This product corresponds to the regulations notified as (EU) 745/2017.

All information, images, pictures and specifications are based on the product information we had at the time the manual was printed. The images and pictures are type examples and do not claim to exactly reproductions of the various parts of your wheelchair.

LEVO AG reserves the right to make changes to the product without previous notice.

3. EC Declaration of Conformity



EC Declaration of Conformity



As manufacturer of the LEVO range of stand-up wheelchairs, the company

LEVO AG
Anglikerstrasse 20
CH-5610 Wohlen
Switzerland

EU SRN: CH-MF-000008751
CHRN: CHRN-MF-20001283
GLN: 7601007997305

declares under its sole responsibility that the Stand-up Wheelchair model

LEVO C³

Basic UDI-DI (GMN) 07613045 91

Product Class I

MDR (EU) 2017/745, Annex VIII, Chapter III, Rule 1

conforms to the provisions of MDR Medical Device Regulation (EU) 2017/745.

The **LEVO C³** is TÜV tested according to EN 12184:2014.

The **LEVO C³** model is also tested in accordance with ISO 7176-19:2008 but is not certified as a seat in a motor vehicle due to the lack of accreditation of the testing laboratory according to ISO 17025.

The materials and components used in the **LEVO C³** model comply with the RoHS Directive 2011/65/EU and the REACH Regulation (EC) No. 1907/2006.

This Declaration of Conformity includes all accessories and options of the **LEVO C³** and is according to Annex IV of Regulation (EU) 2017/745.

The EU Authorized Representative for the MDR (EU) 2017/745 is:
be-on-Market GmbH, Lilienstrasse 33, D-91244 Reichenschwand.
EU SRN: DE-AR-000006148

2023-07-15 - **LEVO AG**

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3.1. Identification Number

The identification and year of manufacturing of your **LEVO C³** is given by the serial number on the product label below the seat in front of the chair. This serial number is unique for every **LEVO C³** and needs to be mentioned in any case of communication with your distributor.

The device is absolutely identified by the serial number and the extended barcode GS1-128.



The following information is included on the **LEVO** type plate as an example:

Identification	Example	Intent / Meaning	Visual aid
Type	LEVO C3	Model LEVO C3/44	
Serial No.	9130604 2017-10	Serial No. 9130604 Year-Month of Production 2017-10	
Color	schwarz	Color black	
Max. Load	Max. user 140kg	max. User Weight 120kg	
Nominal Gradient	Nenn-Steigung 10°	Nominal Gradient, unmoved, direction downhill 10°	

3.2. Warranty

Your **LEVO** product is guaranteed from the date of purchase for:

- **Two years** covering all material and manufacturing defects of mechanical parts.
- **One year** covering all electronic components including the motors.
- **Batteries are excluded from the warranty.**

LEVO AG will not repair or replace free of charge any part or parts found to be defective due to abuse, misuse or lack of maintenance.

The customer has no claim on warranty, if there has been any design modifications (mechanic or electronic) made on the wheelchair without the approval from **LEVO AG**.

Warranty claims should be directed to:

- In Switzerland **LEVO AG**
- Other Countries To your local agent

Addresses and telephone numbers are given on the front page.

4. Safety instructions

4.1. General safety instructions

For your own security we recommend you carefully read and follow all the instructions in this manual.

LEVO AG is not responsible for damage to persons or property resulting from the fact that the user or other person ignored the recommendations, warnings and instructions specified in this manual.

Before using the **LEVO C³**, have your **LEVO** dealer explain the instructions to you. It also helps if you have a friend to listen as well. Study the instruction manual yourself or if you cannot understand it, get a friend to help you to do so. Do not hesitate to ask for any explanation.

Be aware that the surface temperatures can increase when exposed to external sources of heat (e.g. sunlight).

The resistance to ignition of materials and assemblies are as follows:

- Plastic parts according to UL 94-V0
- Upholstered parts according to EN 1021-1, EN 1021-2 or ISO 7176-16

On the **LEVO C³** you find the following symbols attached:



Warning, risk of pinching! Make sure no parts of the body, clothing or other items get jammed



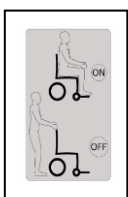
Warning, read user's manual!



Anchorage point for a tie-down strap.



Symbol for wheelchairs that are not suitable for use as a seat in a motor vehicle.



Label for the shutdown of the brake release

4.2. Operation

Never switch off the joystick module when driving. Otherwise the wheelchair will stop abruptly running the risk that you are thrown forward from the wheelchair. Simply release the joystick to stop the wheelchair from moving.

Be aware that your wheelchair can produce electromagnetic emissions and disturb other devices.

If unintended movement or brake release occurs, turn the wheelchair OFF as soon as it is safe.

4.3. Driving

The **LEVO C³** is designed for outdoor and indoor use.

- Whenever you are driving, use the knee support and the chest belt.
- **LEVO** does not recommend driving the **LEVO C³** on uneven, soft or steeply sloping ground.
- Using the **LEVO C³** outdoors, switch on the lights at dusk and dawn dusk and in poor light.

Do not let children drive the wheelchair without supervision.

Avoid driving through puddles with the **LEVO C³**. The wheelchair and especially the electrical components are sensitive to water. Although splashproof, there is a danger of malfunction when wet.

The wheelchair is not designed to carry passengers, independent of their ages.

Look ahead while driving, so that you have sufficient time to react to obstacles and avoid accidents in your path.
Pay attention to pedestrians, children, dogs etc. close to and especially in front of you as they can stop suddenly or change the direction.

Consider the national road regulations; these are different from country to country. It is usually prescribed by law which kind of streets can be used for which kind of vehicle. Inquire at your road traffic licensing department.

Avoid steep edges, hillsides or stairs if you push the chair manually (brake release lever in lower position) as there is a risk of losing control due to the weight and size of the wheelchair. There is also the risk that you can fall from the wheelchair. To overcome an obstacle we recommend the use of a ramp or an elevator.

The necessary force to push the **LEVO C³** manually is higher than small powered wheelchairs. Depending on the ground surface and strength of the person pushing the wheelchair, it can be useful to have a second person on call to help as necessary.

You should under no circumstances attempt to stand up without following all safety precautions.

Standing up stresses your body in ways you may not be used to. Therefore we recommend, consulting your doctor or physical therapist before using the standing function of the **LEVO C³**.

The **LEVO C³** is only allowed to bring you into the stand-up position when the free wheel device is "ON", this guarantees the motor brakes function correctly. Do not stand-up while the chair is in "free wheel" configuration!

You should only bring the **LEVO C³** into standing position if the chair is on even, solid ground. If this condition is not respected, there is a danger of tipping over.

Driving long distances in the standing position is not recommended in outdoor areas. The function is meant primary for moving around indoors, as in the kitchen or in the office for example.

We recommend standing up only when accompanied in case of sudden spasticity, convulsions and similar problems.

4.5. Safety belt system

It's absolutely essential to mount the knee support and the chest belt correctly before you use the stand-up function or begin driving (see section 9.2.)

The chest belt is exclusively intended to hold the torso of the user while driving and standing. It is not intended as a protective device for collisions and/or accidents.

4.6. Transportation

Do not lift the wheelchair using the mobile parts. This can lead to damage to property or persons and/or damage to the wheelchair.

4.7. Servicing and maintenance

The **LEVO C³** is a sophisticated piece of machinery. Do not attempt to maintain it yourself. For all maintenance work, please contact an authorized dealer. Your authorized dealer should be allowed to service the wheelchair once every year.

You should only use original **LEVO** spare parts for any repairs or changes. If you use other parts, the function and the security of the wheelchair can be influenced. Your safety is not guaranteed and the wheelchair is no longer covered under warranty.

Programming should only be conducted by healthcare professionals with in-depth knowledge of PG Drives electronic control systems. Incorrect programming could result in an unsafe set-up of a wheelchair for the user. **LEVO** accepts no liability for losses of any kind if the drive or stability characteristics of the wheelchair are altered without prior notification and discussion with **LEVO**.

All inappropriate changes of the wheelchair and its different systems can lead to an increased risk of accident.

All changes and interventions have to be made by an authorized dealer, if you're unsecure about any issue, please ask your dealer first.

The expected life of your **LEVO C³** is approximately 7 years under normal use and depending on the frequency of service and maintenance. Excluded from this life are the electronic components (especially batteries) and parts such as wheels, seat, back, knee and arm pads.

Please avoid exposing the wheelchair to extreme heat. Please note as well that if exposed to high humidity or salt the wheelchair should be dried frequently.

5. Preparing the wheelchair for use and operation

5.1. Dispatch and transport

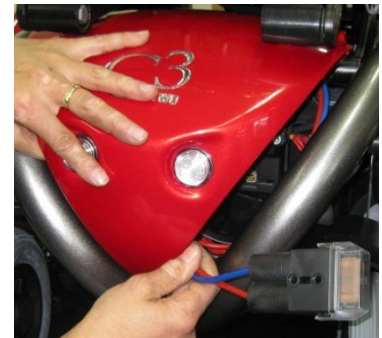
For delivery **LEVO** wheelchairs are packed in a cardboard box. The back is detached and carefully packed. Particularly delicate parts have extra protection to avoid any damage that could be caused by transportation. All wheelchairs are transported by lorry or air freight. To ensure no damage during transport the main fuse is taken out.

Initial operation / Main fuse handling in case of replacement, transportation and storage

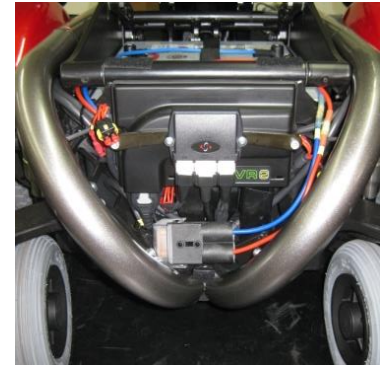
Installation of the main fuse

Fuse version since April 2011

Before shipping, the 70A main fuse is taken out. Before using the chair the main fuse has to be reinserted. You should also do this when travelling by air with your wheelchair.



The main fuse housing is under the chair cover in the rear. To get access, carefully open the cover as shown above.

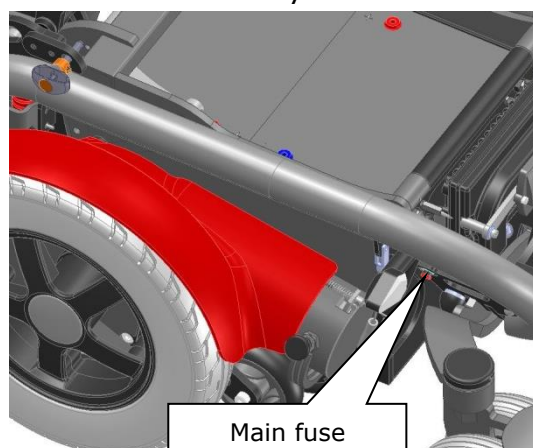


Open the fuse cover, insert the fuse which is delivered in a separate plastic bag and snap the fuse cover back. Now the chair can be brought into standing position to get access to the fuse cabling. Store the fuse cabling properly above the batteries and the main fuse housing below the control system under the chair cover.

Activating the main fuse

(Cut-out version until March 2011).

To activate the main fuse, push in the cut-out button.



5.2. Delivery

Because of the complex nature of this wheelchair it will be delivered and demonstrated to you by your local agent.

The wheelchair comprises the following components:

	Component	Quantity
1.	Wheelchair base	1
2.	Seat unit	1
3.	Backrest Frame	1
4.	Knee support	1
5.	Chest strap	1
6.	Joystick unit	1
7.	Joystick Module	1
8.	Set of batteries	1
9.	Battery charger	1
10.	Tool set	1
11.	Options and accessories	Corresponding to order form

5.3. Storage

The ideal condition to store the **LEVO C³** is at a temperature between – 40° and + 60° Celsius (between -30° and +140° Fahrenheit). The humidity should not be above 90%. Please observe these conditions to prolong the lifetime of your wheelchair.

To prevent the batteries from discharging too quickly, we recommend you take out the main fuse (see section 5.1.). We also recommend charging the batteries at least every 2 months if the chair is not used.

5.4. First adjustments

Because the **LEVO C³** was ordered to your personal measurements, it should fit well when delivered. Should you need adjustment, please see chapter 11.

Your local agent is responsible for the final adjustments. Take the time when accepting delivery to ensure that the chair fits correctly.

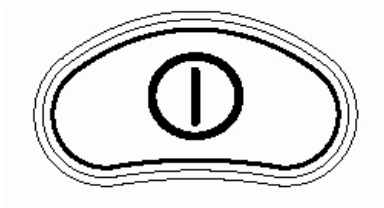
6. Control unit

6.1. VR2-control



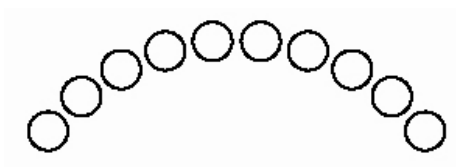
On the control unit you find a joystick, buttons and symbols. We take a closer look at these in the following sections.

6.1.1. On-/ Off-button



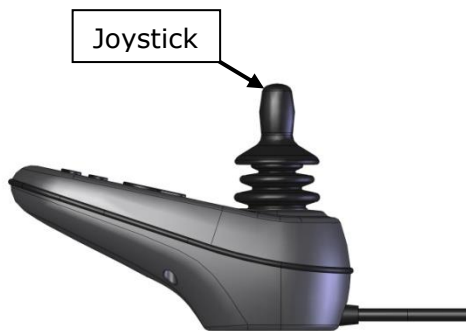
With the On-/ Off-button the chair can be turned on or switched off. Do not use this button to stop the wheelchair unless there is an emergency.

6.1.2. Battery gauge



The battery gauge shows you that the wheelchair is switched on and it shows you how much power there is left in the batteries. The gauge is also used for electronic fault detection (see chapter 18.)

6.1.3. Joystick



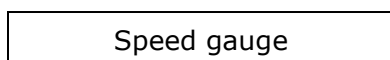
The joystick controls the direction and speed of the wheelchair.

To drive forwards push the joystick forwards. The further you push it from the centre the faster the wheelchair will move. Let go of the joystick and the wheelchair will stop and the brakes come on.

For backwards driving push the joystick backwards. Pushing the joystick to the right results in movement to the right. Pushing the joystick to the left will move the chair to the left.

The joystick is also used to choose and to move the seat actuators (see section 6.1.5.).

6.1.4. Speed



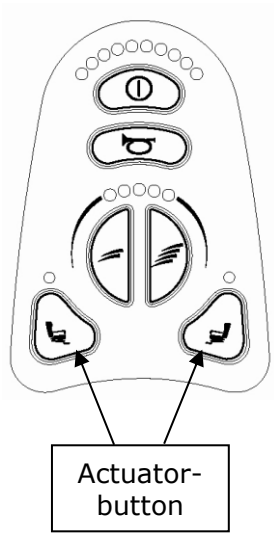
This is a gauge that shows the maximum speed setting for the wheelchair. This gauge also indicates if the speed of the wheelchair is being limited or if the control system is locked.

If one LED is illuminated, you will move at the slowest speed. 5 illuminated LED's mean that you will drive with the highest programmed speed.

If the LED's are flashing, it means the speed is reduced. This happens when you go into standing position.

If the LED's ripple up and down, it means the chair is locked.

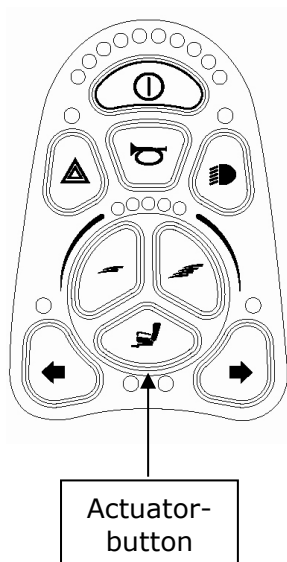
6.1.5. Change of the seat position



Standard chair without light kit:

By pressing the left actuator-button, you can activate the stand-up function. If you move the joystick forward, the chair will raise upwards, if you move the joystick backwards, the chair will move downwards.

If your chair is equipped with the option "Tilt in space", it can be activated by pressing the right actuator-button. If you move the joystick backwards, the complete seat will tilt backwards. If you press the joystick forward, the seat will move back to the horizontal position.

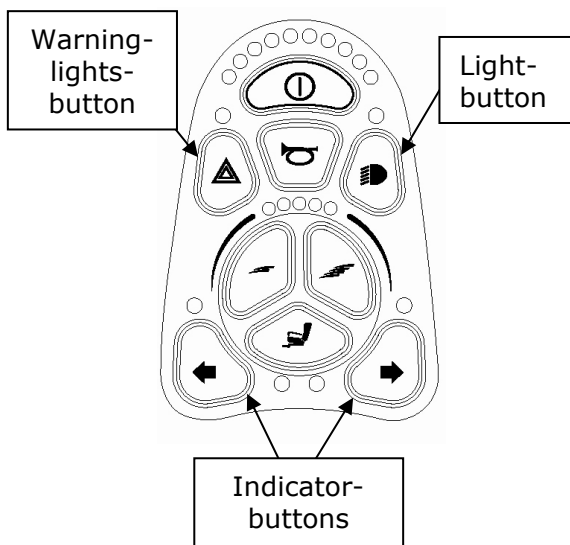


Chair with light kit:

If your chair is equipped with the light kit, you have one button to choose the actuators. To activate the stand-up function, press the actuator-button, move the joystick to the left, until the left LED under the actuator-button is illuminated. Now you can move the joystick forward to bring the chair into the stand-up position. To return to the seated position, move the joystick backwards.

If you have the option "Tilt in space" on your chair, to choose this actuator, press the actuator-button and move the joystick to the right, until the right LED is illuminated. If you move the joystick backwards, the complete seat is tilting backwards, if you press the joystick forward, the seat is moving back to the horizontal position.

6.1.6. Light kit



If you chose the optional light kit for your chair, the keypad looks as shown on the left.

To activate the lights, press the light-button to switch on the two front and two rear lights on your chair.

To indicate a left turn, press the left indicator-button. To indicate to the right, press the right indicator button.

If you have a breakdown or you would like to call attention to yourself, you can activate all indicators at the same time with the warning-lights-button.

6.1.7. Horn



This button sounds the horn.

6.1.8. Locking/ unlocking the wheelchair

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:

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

To unlock the wheelchair:

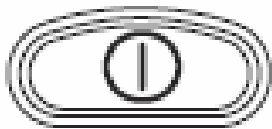
- Use the on/off button to switch the control system on. The speed indicator will be rippling up and down.
- Move the joystick forwards until the control system beeps.
- Move the joystick in reverse until the control system beeps.
- Release the joystick, there will be a long beep.
- The wheelchair is now unlocked.

6.2. R-net control (option)



On the control unit you find a joystick, buttons and symbols. We take a closer look at these in the following sections.

6.2.1. On-/ Off-button



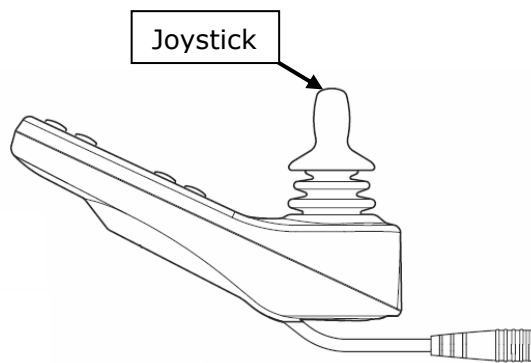
With the On-/ Off-button the chair can be turned on or switched off. Do not use this button to stop the wheelchair unless there is an emergency.

6.2.2. Battery gauge



This gauge is only visible on the display, if the controller is switched on. It shows you how much power there is left in the batteries. If the gauge starts to flash, it means the chair is still working correctly but that the batteries should be charged very soon.

6.2.3. Joystick



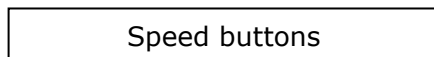
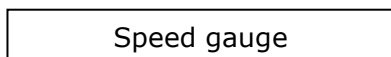
The joystick controls the direction and speed of the wheelchair.

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For backwards driving push the joystick backwards. Pushing the joystick to the right results in movement to the right. Pushing the joystick to the left will move the chair to the left.

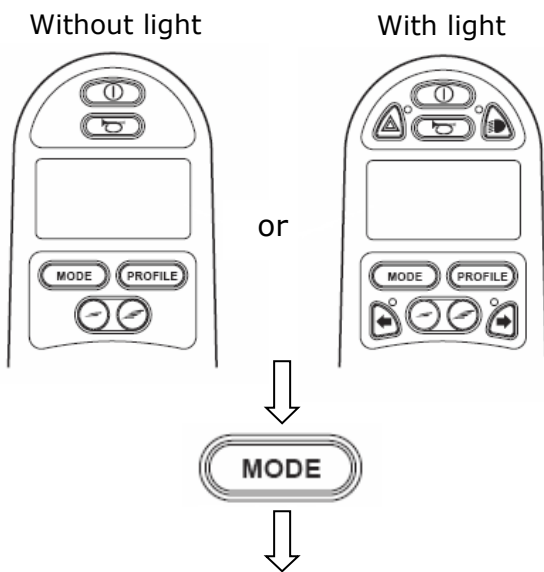
The joystick is also used to choose and to move the seat actuators (see section 6.2.5.).

6.2.4. Speed



This indicator is only visible on the display when the control is switched on. The display shows the set speed. The speed can be set in 5 steps with the speed selection buttons.

6.2.5. Change of the seat position



Picture A, menu standing function



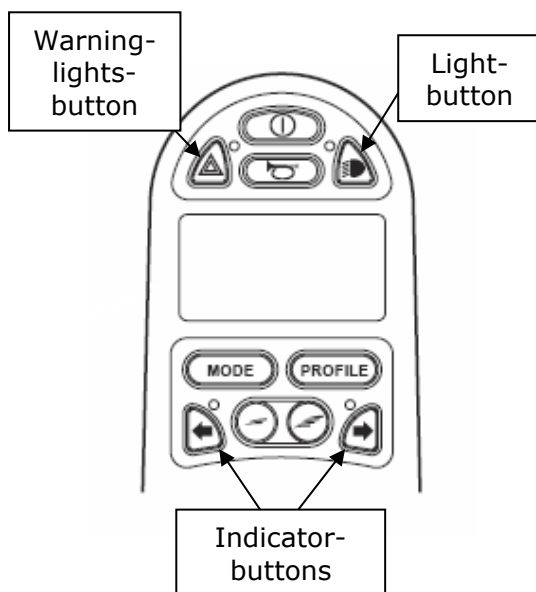
Picture B, joystick pressed to the left or right -> Tilt in space

By pressing the MODE-button, you get into the standing function menu (picture A should appear on the display). If you now press the joystick forward, the seat will raise. If you press the joystick backwards, the seat will lower.

If your chair is equipped with the option "Tilt in space", you can choose this function in the standing menu by pressing the joystick to the left or right (picture B should appear on the display). If you pull the joystick backwards, the complete seat will tilt backwards. If you press the joystick forwards, the seat will move back into the horizontal position.

The standing or the tilt motion can be stopped and fixed at any position.

6.2.6. Light Kit



If you chose the optional light kit for your chair, the keypad looks as shown on the left.

To activate the lights, press the light-button to switch on the two front and two rear lights on your chair.

To indicate a left turn, press the left indicator-button. To indicate to the right, press the right indicator button.

If you have a breakdown or you would like to call attention to yourself, you can activate all indicators at the same time with the warning-lights-button.

6.2.7. Horn



This button sounds the horn.

6.2.8. Locking/ unlocking the wheelchair

The R-net 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:

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

To unlock the wheelchair:

- Use the on/off button to switch the control system on (a lock is showed on the display).
- Move the joystick forwards until the control system beeps.
- Move the joystick in reverse until the control system beeps.
- Release the joystick, there will be a long beep.
- The wheelchair is now unlocked.

7. Electromagnetic interference (EMI)

Important: You must be aware of the effect of electromagnetic interference (EMI) regarding your LEVO C³. Please study the following facts carefully.

Electromagnetical interference of transmitter and radio wavelength

Powered wheelchairs might be influenced by strong electromagnetic interference. This interference is caused by radio and TV stations, amateur radio sets (walkie-talkie), two-way radios and mobile phones. Interference (especially of radio stations) may have an influence on the brakes of a powered wheelchair so that they get released and so the chair runs away. It could also happen that the wheelchair starts driving in a unwanted direction or the stand-up function could operate with request. There could be damage to the steering system of the powered wheelchair.

The intensity of power is measured in volt per meter (vpm). All powered wheelchairs are able to resist a certain amount of electromagnetic interference. This is called the "level of disruptive strength". The security depends on the level of disruptive strength; the higher the level the better the protection. Thanks to modern technology the capability of disruptive strength is up to 20 vpm.

The **LEVO C³** standard version (no extra protective measures) is supplied with a disruptive strength level of 20 vpm.

The **LEVO C³** is constructed to resist to a regular level of interference as it occurs in a household. Beside that there exist a certain number of sources of relatively strong magnetic fields from which you should stay at a safe distance. Some of these magnetic fields are obvious and easy to avoid. Some other are not easy to recognise and can be hard to avoid. Please be aware of the following list of sources of interference and avoid getting close to these disruptive factors. The EMI-risk is reduced to the minimum when you follow these instructions.

The sources of radiated EMI are put in three categories:

- Portable sender and receiver on which an aerial is directly mounted. Examples: CB-radio, walkie-talkie, sender and receiver of alarm systems, fire alarm, police radio equipment, mobile phone and various private communication systems. Please notice: Some mobile phones and similar objects transmit signals as soon as they are switched on even if they are not in use at the moment! There are no known incidents caused by mobile phones to date.
- Mobile sender and receiver of intermediate range as installed in police cars, fire engines, ambulances and cabs. The aerial is normally fixed on the outside of the vehicle.
- Long-range senders and receivers such as radio and TV stations and amateur radio sets.

Be aware that wireless phones, lap tops, AM/FM-radios, TVs, CD players, recorders as well as gadgets like razors, hair dryers and so on are only small sources of

electromagnetically interference. These objects cannot influence the functionality of the **LEVO C³**.

Electromagnetical interference in regard to a powered wheelchair

Considering that electromagnetical power reaches high intensity in just a short time as soon as you get close to the source, it is advised to take special care when carrying a sender and receiver with you. If such an item gets too close to the controller of the wheelchair, the electromagnetic energy can influence negatively the functioning of brakes as well as the drive characteristics of the wheelchair.

Warning: Your wheelchair can produce electromagnetic emissions and disturb other devices.

If unintended movement or brake release occurs, turn the wheelchair OFF as soon as it is safe.

8. Driving the wheelchair

8.1. Driving in general

Before starting to drive your wheelchair, take time to read all the instructions regarding the **LEVO C³** and get to know the controls. When first learning to drive your wheelchair, practice in an area you know well. We suggest a large flat smooth area such as your living room or the driveway to your home. Do not attempt to drive the wheelchair in confined areas or where there is traffic until you are sure you can control the wheelchair safely.

Please note, that the knee support and the chest belt must be correctly mounted as in chapter 9.

When driving outdoors always have the seat plate in a horizontal position or tilted backwards (in case seat angle tilt is an optional function).

Switch on the joystick module and practice driving the wheelchair slowly forwards, backwards and from side to side. When you have more confidence, increase the speed and practice until you have mastered driving the wheelchair.

It is possible to drive the wheelchair in the standing position. Speeds are cut to half speed as soon as the seat leaves the lowest seat position. When indoors practice standing up in the wheelchair and slowly driving it across the room.

The wheelchair allows you to drive in absolute safety in a sitting position on slopes with a maximum gradient up to 10 degrees. When driving up or down steeper slopes than this or over uneven ground, braking and steering response will be limited due to reduced traction. On a slope, do not lean out of the wheelchair down the slope. Driving in a standing position is no problem on even and non-angled ground.

A limit switch with some important programmed security features is a standard of the **LEVO C³**. Speed is automatically reduces in correlation to the current position of the chair and the inclination of the ground. In extreme conditions, the system inhibits the motors to ensure the safety of the user. To move again, you should lower the seat plate. Please read the detailed information below.

8.2. Obstacles

Avoid driving your **LEVO C³** over obstacles that are higher than 80 mm. The risk of tipping over is higher when you drive over high curbs with risk to yourself as well as to your wheelchair.

If you like to pass an obstacle you never drove over before, **LEVO** recommends you do this with an assistant while you get used to the feel of the wheelchair.

Because of the 4WD-drive mechanism, obstacles are best approached at an angle of 45°.

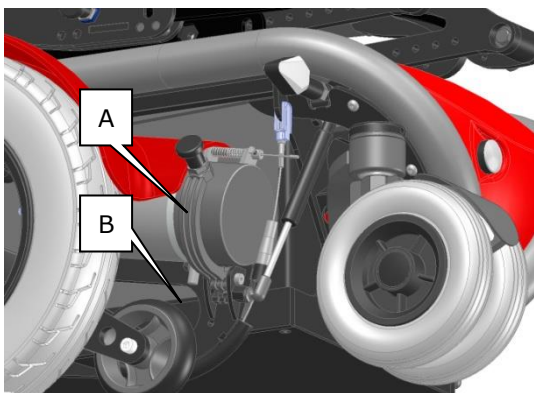
Drive carefully if you pass an obstacle.

8.3. Permissible Inclinations – Static Stability

The TÜV-Test of the **LEVO C³** Static Stability determined the following results:

Sitting position facing downhill	10°
Standing position facing downhill	3°
Sitting position facing uphill (front wheels not touching the ground at the max., but still 100% of stability)	10°
Sitting position crossways direction	10°
Sitting position 45° to the horizontal direction	10°

8.4. Unlocking the drive brakes



To disengage the motor brakes in order to push the chair manually, switch off the controller, pull the quick release knob (A) and press the lever (B) down from ON to OFF.

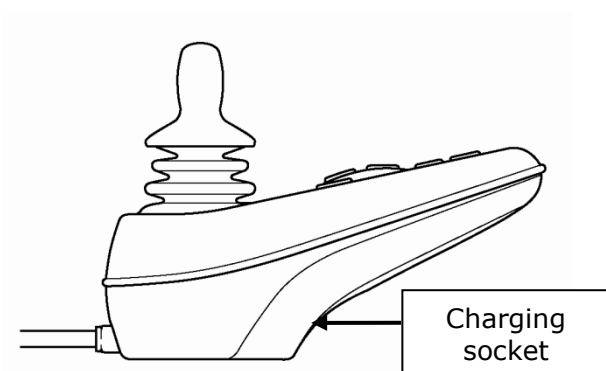
Attention: The brakes do not function in this position.

To bring the wheelchair in the standard driving mode, press the lever (B) upwards from OFF to ON and take care that the quick release knob (A) snaps back in.



The lower photograph shows the brake release as installed from June 2011.

8.5. Charging the batteries



Use only the LEVO charger delivered with the chair.

To charge the batteries, switch off the control unit and plug the charger into the socket beneath the front of the joystick.

If the joystick is switched on, the batteries will not charge.

It takes at least 10 hours to fully charge the batteries when completely discharged.

We recommend you charge the batteries every night until morning.

9. Safety harness

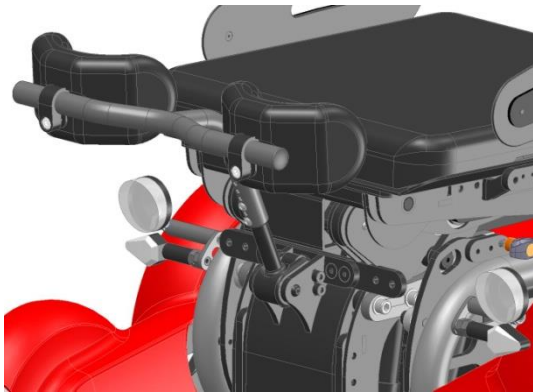
The safety harness consists of two parts: a chest strap and a knee support.

Caution: Before attempting to stand in your wheelchair, fit and adjust the chest strap and the knee support.

9.1. Knee support

The knee support helps your knee not to bend in the standing position and to keep you in the perfect position during the stand-up motion.

9.1.1. Knee support „Pro“

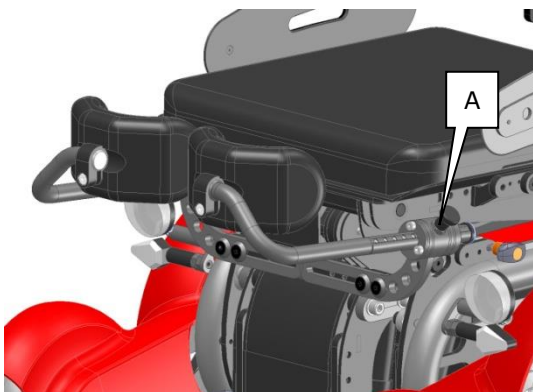


You can insert the knee support with just one hand.

To remove the knee support, pull it gently back and then upwards. If the adjustment is incorrect, please see section 11.9. to adjust the knee support.

Adjustable knee pads are available.

9.1.2. Knee support „Integral“



To use the knee support, make sure that it is correctly adjusted.

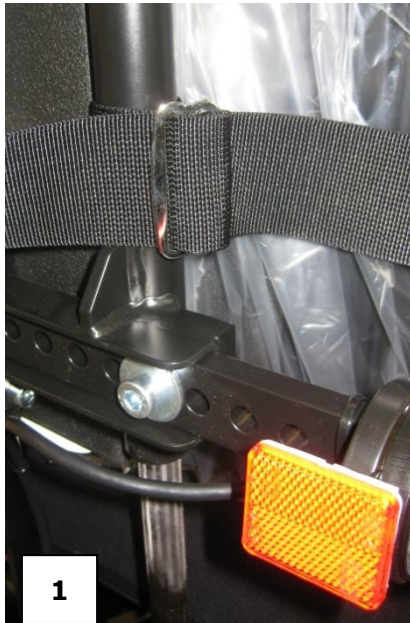
Pull the quick release knob (A) and bring the knee support into position. Release the quick release knob and make sure it is locked in place. If the adjustment is incorrect, please see section 11.9. to adjust the knee support.

Adjustable knee pads are available.



There is a park position which allows the "Knee support Integral" to be swung aside during transfer.

9.2. Chest strap



The chest strap has to be fixed around the backrest tubes. The height of the chest strap may be changed.



Guide the chest strap around the backrest posts to the front and secure your torso by closing the buckle (picture 2). Adjust the length of the strap so that it is not too tight but fits comfortably across your chest.



The length can be adjusted in two different ways.

There is a closure at the buckle for small adjustments of the length (picture 3).



If you need to adjust the length of the chest strap more, you need to work at the back of the chest strap.

Take off the chest strap and change the length at the two metal-buckles (picture 4).

10. Transfer

10.1. Getting into the wheelchair

- Make sure the wheelchair joystick module is switched off.
- Check that the motor disengaging lever is in the ON position to ensure that the power wheels are acting as brakes.
- Lift up the footplates.
- Transfer yourself onto the seat using the armrests for support or have yourself transferred onto the seat.
- Lock the footrests down and rest your feet on them.
- Fit the knee support and chest strap.

10.2. Getting out of the wheelchair

- Make sure the wheelchair joystick module is switched off.
- Check that the motor disengaging lever is in the ON position to ensure that the power wheels are acting as brakes.
- Remove the chest strap and knee support.
- Lift up the foot plates.
- Transfer yourself in your usual way out of the wheelchair or have yourself transferred out of the wheelchair.

10.3. Sideways transfer

- Drive as close as possible to a chair, bed or any other objects you want to transfer to.
- Make sure the joystick module is switched off.
- Check that the motor disengaging lever is in the ON position to ensure that the power wheels are acting as brakes.
- Lift up the footrest of the wheelchair and put your feet on the ground.
- Lift up the armrest on the side you are transferring to.
- Transfer yourself in your usual way out of the wheelchair or have yourself transferred out of the wheelchair.

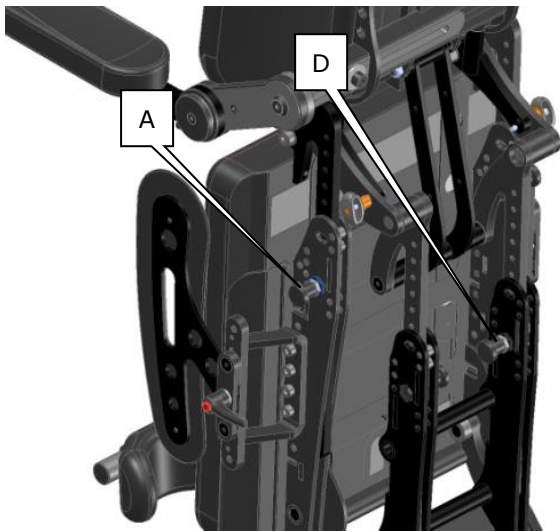
11. Individual settings

The **LEVO C³** is individually adjustable to every person. Some parts need tools for the adjustments; some parts need no tools.

Required tools:

- Allen key: from 3mm to 8 mm
- Spanner: 13 mm

11.1. Adjustment of the seat depth



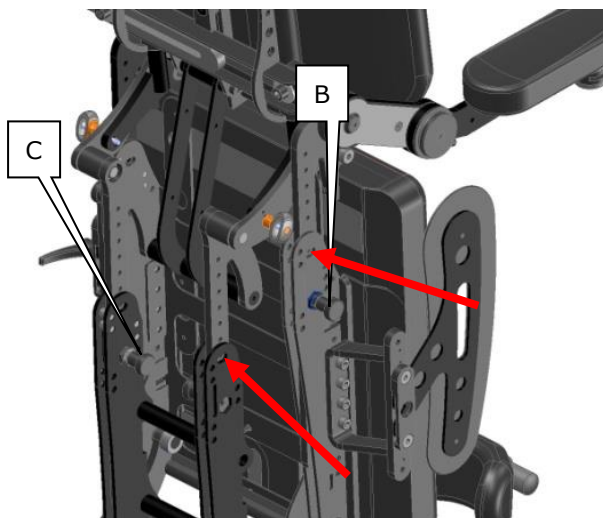
The seat depth is adjusted with (optional w/o) tools.

Adjust the lower levers first. Release the screw (pull the bolt) (C) and (D). Now you can set the levers to the necessary length.

Tighten the screw (release the bolt) and lock the lever in the new position.

Now you can adjust the upper levers. Release the screw (pull the bolt) (A) and (B). Now you can adjust the lever to the **same number/length** as the lower levers.

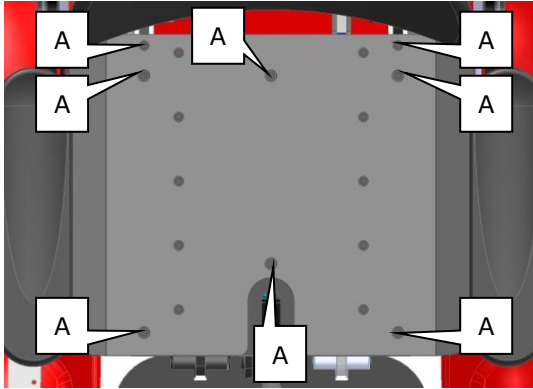
Tighten the screw (release the bolt) and lock the lever in the new position.



Please see the red arrow on the picture.

Warning: Please see the correct position of the lower and the upper lever. For example, if you choose a seat depth of 48cm, 48cm must be shown in the small window (red arrow at the picture left).

11.2. Change of the seat width



First, take off the seat cushion.
Telescope the seat plate to the first position (see section 11.1.)

Untighten the 8 screws (A) at the seat plate, to be able to take off the whole seat plate.

Put the new wider/smaller seat plate on the chair and tighten the 8 screws to fix the new seat plate.

The adjust the distance between the armrests to the seat plate, follow the instructions in section 11.3.

To adjust the knee support to the changed seat width, follow the instructions in section 11.9.

If the chair is equipped with the skirt guard, you have to change the bracket, to match it with the seat width.

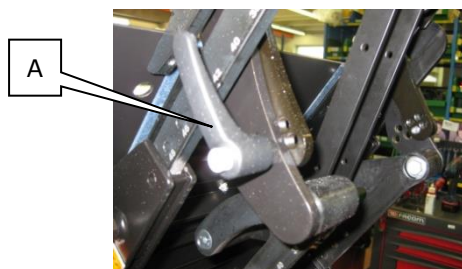
11.3. Change the distance between the armrests



Untighten the two screws. Now you can adjust the armrests in the width.

If you have adjusted them to the desired width, tighten the screws.

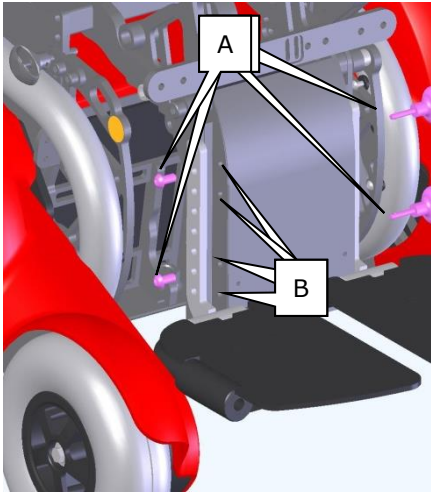
11.4. Adjustment of the backrest angle



You can adjust the backrest in different angles.

Unscrew the lever-screw (A) on both sides. Now you can tilt the backrest back and forwards to the desired angle. Put the lever-screw (A) into the hole where the backrest post and the plate correspond.

11.5. Change of the distance footrest - seat cushion and angle adjustment of the footrest



The footrest will be adjusted with (optional w/o) tools.

To change the height of the footrest, release the screw (A). Now you can set the footrest to the necessary height.

Tighten the screw back in place.

On both sides there are 4 holes (B) you can use to adjust the height.

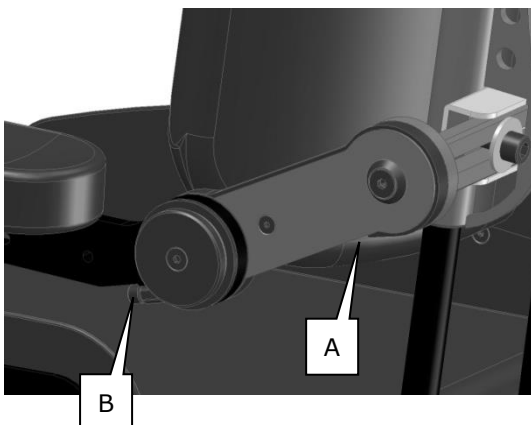


The angle of the footrest plate is adjustable by turning on the screw (C).

If you turn the screw clockwise, the plate is rising, if you turn the screw counter clockwise, the plate is lowering.

To ensure that the screw does not work loose, we recommend mounting the screw with thread locker.

11.6. Adjustment of the armrest height/angle



To adjust the height or angle, please refer to the following:

Height adjustment

To lower the armrest, unscrew screw A. To increase the height, tighten screw A.

Angle adjustment

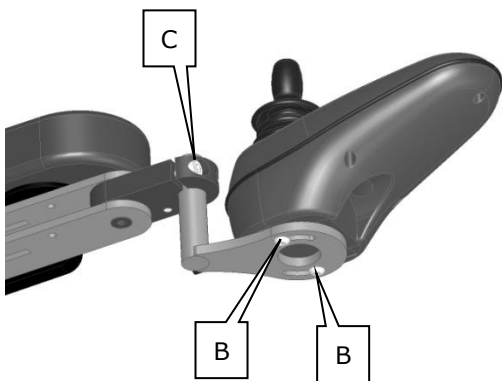
To lower the angle, unscrew screw B. To increase the angle, tighten screw B.

11.7. Adjustment of the armrest length



To adjust the position of the armrest pad, loosen the two screws (A) and shift the pad forwards or backwards. When you reach the required position, tighten the screws (A) until the pad is fixed.

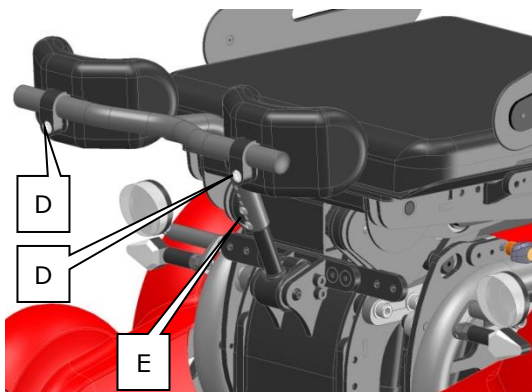
11.8. Change the position of the control unit



To adjust the control unit to the inner or outer side, loosen the screws (B) and screw (C) and bring the control unit into the necessary position. When you reach the required position, tighten the screws.

11.9. Adjustment of the knee support

11.9.1. Knee support „Pro“



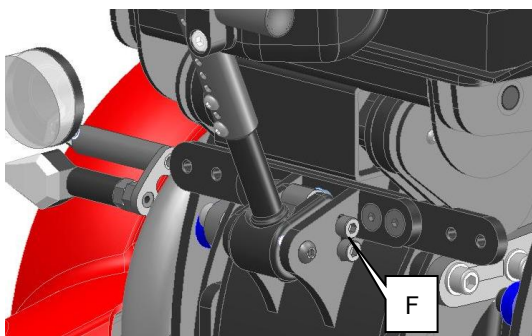
Adjusting the distance between the knee pads:

Untighten the two screws (D), adjust the knee pads to the necessary width and tighten the screws (D).

Adjusting the height of the knee support:

Untighten the two screws (E), adjust the height of the knee support. When you reach the required position, put the screws (E) back into place and tighten them.

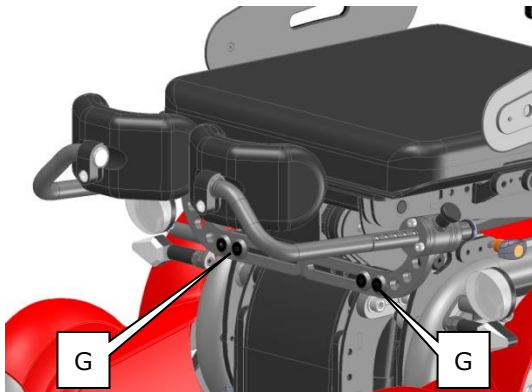
Adjustable knee pads are available.



Adjustment of the angle:

Untighten the 4 screws (F) and adjust the angle of the knee support. When you reach the required position, tighten the screws.

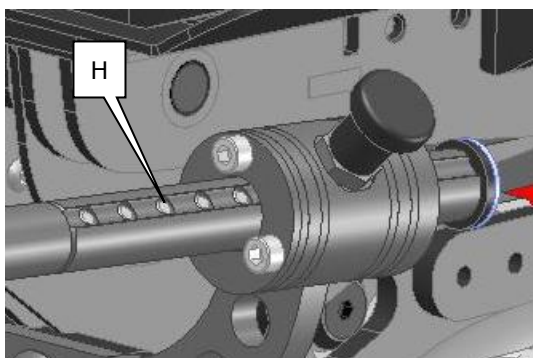
11.9.2. Knee support „Integral“



Adjusting the distance between the knee pads:

Untighten the 4 screws (G), adjust the knee support to the necessary width and tighten the screws (G).

Height adjustable knee pads are available.

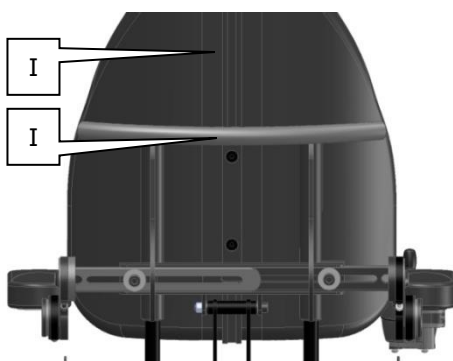


Adjusting the depth of the knee support:

Check in which hole, the quick release bolt has to lock, turn the set screw (H) counterclockwise downwards, that the quick release bolt can lock into the hole.

Check the hole that was used before, turn this set screw clockwise that the hole is blocked.

11.10. Adjustment of the backrest height



You can adjust the height of the backrest by loosening the two screws (I). You are then able to shift the backrest up and down. Once in the required position, tighten the screws (I).

Please double check the adjustment in standing position. The back must have space so that the seat cushion and back must not touch the seat plate in the full standing position.

12. Options

The **LEVO C³** can be equipped with several options. Most options can also be mounted after the chair is delivered. Please contact your **LEVO** dealer.

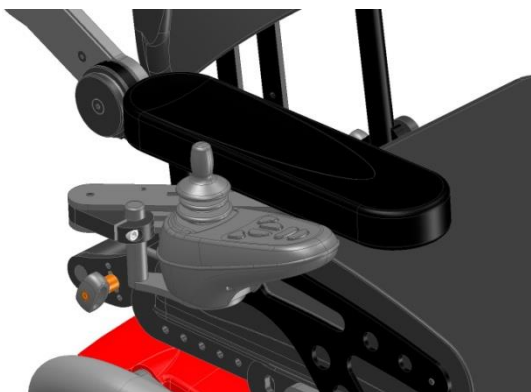
12.1. Tilt in space



With the option „Tilt in space“ it is possible to tilt the seat to an angle of approx. 30° to the back to achieve a more comfortable seat-/ rest-position. The “Tilt in space” is a good preventive to decubitus.

In section 6.2.5. you can see how the “Tilt in space” can be adjusted.

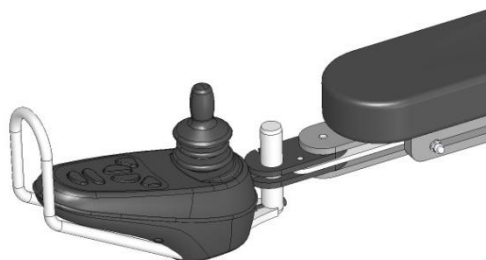
12.2. Swing away holder for the Control unit



The swing away joystick holder is used to drive closer to a table for example. The transfer is also easier if the control unit is retractable.

With the aid of the magnet that’s mounted at the armrest, you can adjust the force needed to move the control unit.

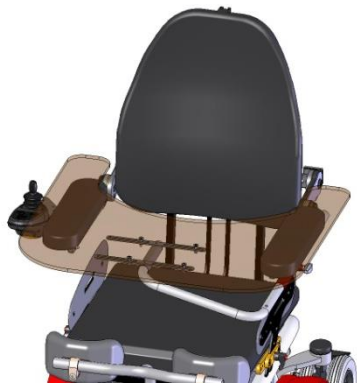
12.3. Joystick protection guard



You can avoid collisions between the joystick and other objects with the joystick protection guard.

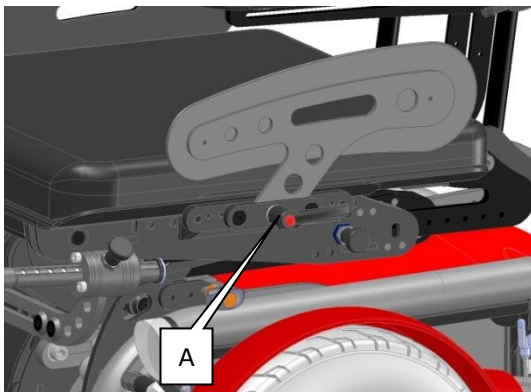
It also offers protection to the hand on the joystick.

12.4. Swing away table tray



The swing away table tray is retractable to the side when not in use.

12.5. Skirt guard



The skirt guard should prevent the clothing from hanging beside the seat and is getting into the drive wheels or the standing mechanism.

The skirt guard is easily displaceable for lateral transfers. Just untighten the stop lever (A) and lift the skirt guard upwards to remove it.

12.6. Upper leg support



Holds the thigh and stabilizes the leg axis in seating and standing positions.

Can be adapted individually in position, distance, angle and height.

To change the position, open the zipper at the outside of the pad and loosen the screws. Adjust the pad to the required position and retighten the screws.

12.7. Chest role

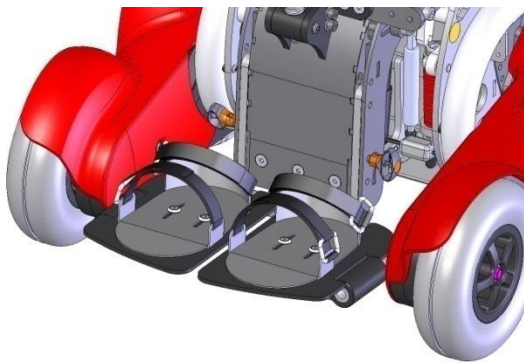


The chest role gives a feeling of more safety and stability, especially while standing.

Important: It does not replace the chest strap.

It is individually adjustable in the height.

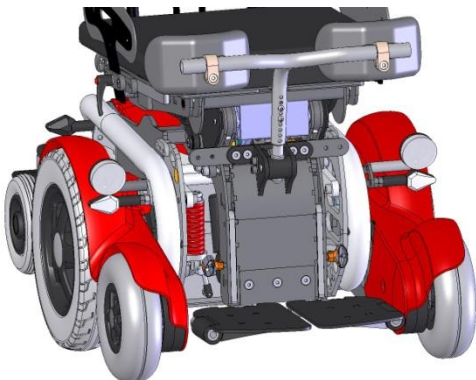
12.8. Foot guide



The foot guides give better means to place and stabilize the feet.

They are individually adjustable by drilling two holes into the footplate at the required position and mounting the foot guides with the screws provided.

12.9. Lamps for outdoor use with indicators



Some countries require a fully functional light kit, to drive on public roads with the chair.

LEVO AG recommends you equip your chair with lights if you use your **LEVO C³** predominantly outdoors.

If you wish to equip your chair with a light kit after delivery, contact your **LEVO** dealer.



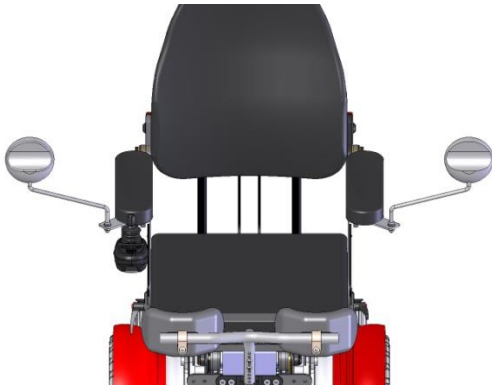
12.10. Joystick-top



If you are not satisfied with the standard joystick knob, there are several different shapes available.

To change it, just pull the knob upwards and push the new knob over the joystick post.

12.11. Rear view mirror

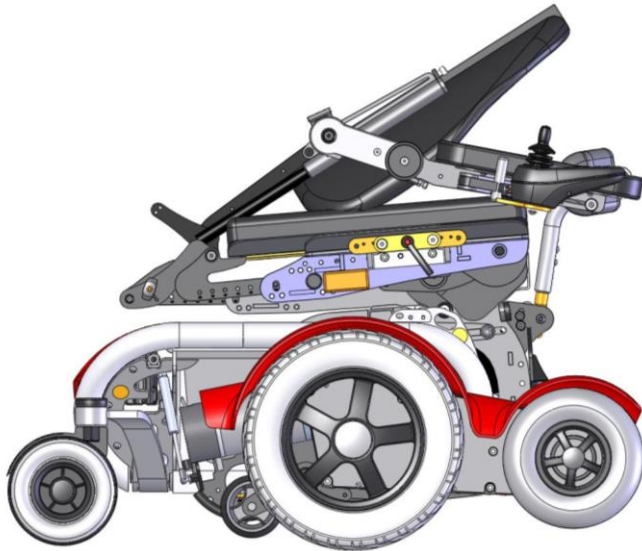


To have a better view in traffic, rear-view mirrors can be fitted.

13. Transportation of your wheelchair

To reduce the dimensions of the chair for transport, you can:

- Flip up the footrest
- Fold down the backrest (take off the quick pin and fold it)



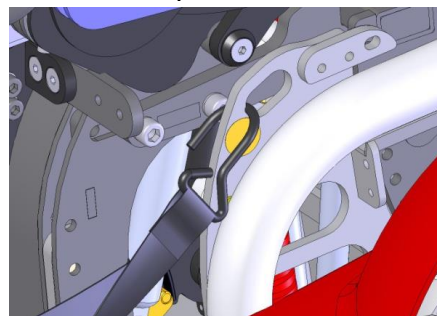
13.1. Transportation in a vehicle without the person in the wheelchair

When transporting the wheelchair in a motor vehicle, make sure that the wheelchair is secured so as to prevent it sliding around or tipping over.

Just use WTORS which meets ISO 10542 secure the wheelchair at the marked anchorage points - hook stickers fitted.



There are 2 fixation points in the front



and 2 fixation points in the rear.



13.2. Transportation in a vehicle – user in wheelchair



The **LEVO C³** has been crash tested according to standard ISO 7176-19:2001 with 4-point Wheelchair Tie Down and Occupant Restraint Systems (WTORS). and Dahl Docking Station.

Please read the information/instructions below **before** using **LEVO C³** for car transportation:



Danger!

- Ensure that the vehicle is suitably equipped to transport a passenger in a wheelchair, and ensure the method of access /egress is suitable for your wheelchair type.
- The vehicle should have the floor strength to take the combined weight of the occupant, the wheelchair and accessories.
- The wheelchair should be secured in a forward facing direction. This wheelchair is tested to ISO 7176-19, for use in road vehicles and meets the requirements for forward facing transport and head on collisions. The wheelchair has not been tested for other directions in a vehicle.
- Use WTORS (Wheelchair Tie Down and Occupant Restraint Systems) only in accordance with the WTORS manufacturer's instruction.

Danger!

- The wheelchair can only be secured by using the tie-down points on the wheelchair's frame
- The tie-down points (2 in the front, 2 in the back)
- are indicated by the tie-down symbol.
- The wheelchair may not be secured onto any accessories (wishbones, armrests, anti-tip brackets etc.).
- No changes or replacements must be made to the anchorage points/ car fastenings on the wheelchair for docking system or 4 point strap tie down systems, or to constructional elements or parts of the frame without consulting the manufacturer.



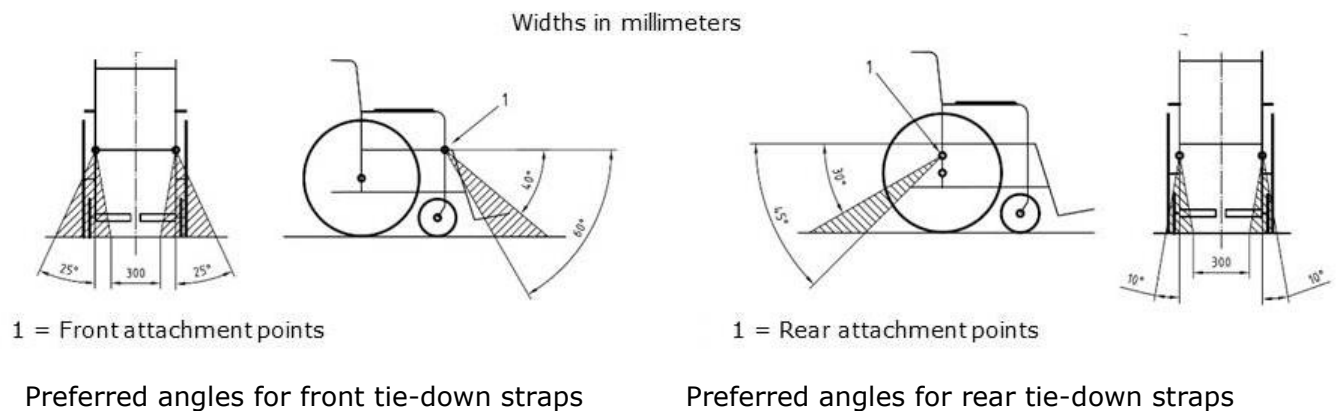
13.2.1 Securing the wheelchair with a WTORS restraint system

Danger!

- Standard ISO 10542-1 approved 4 point WTORS (Wheelchair Tie Down and Occupant Restraint Systems), are only tested to 85 kg.
- For wheelchairs heavier than 85 kg it is recommended to use to use an ISO 10542-1 compliant WTORS (Heavy Duty System), which is rated for the total weight of the wheelchair including any options. If using a Heavy Duty System, use 4 straps to secure the wheelchair, 2 straps at the front and 2 straps at the back.
- If using a standard 4 point WTORS for securing a wheelchair heavier than 85 kg, use 6 straps to secure the wheelchair, 2 straps at the front and 4 straps at the back.
- Never use equipment not labeled with ISO 10542.

Tie-down strap angles:

When fitted tie-down straps angles should fall within the preferred angles shown below.



13.2.2 General occupant restraint instructions

Danger!

- Use a 3-point occupant restraint system to secure the occupant.
- Both pelvic and upper torso restraint belts must be used to restrain the occupant to reduce the possibility of head and chest impacts with the vehicle components.
- Any wheelchair anchored occupant restraint i.e. 3-point belt, harness or postural supports (lap straps, lap belts) should not be used or relied on for occupant restraint in a moving vehicle, regardless if labeled ISO 7176-19, SAE J2249 or any other. Use a vehicle anchored and certified occupant restraint system instead.
- Use a suitable positioned headrest when being transported in a wheelchair.
- Wheelchair anchored postural supports (lap straps, lap belts) should not be used or relied on for occupant restraint in a moving vehicle.
- Occupant restraints should make full contact with the shoulder, chest and pelvis and pelvic belts should be positioned low on the pelvis near the thigh-abdominal junction (meeting the requirements specified in ISO 7176-19:2008).
- The upper torso restraint belt must fit over the midpoint of shoulder and across the chest as illustrated
- Restraint belts must be adjusted as tightly as possible consistent with user comfort.
- Restraint belt webbing must not be twisted when in use.
- Care should be taken when applying the occupant restraint to position the seatbelt buckle so that the release button will not be contacted by wheelchair components while driving or during a crash.
- Belt restraints must not be held away from the body by wheelchair components such as armrests or wheels.



Illustration of improper belt-restraint fit

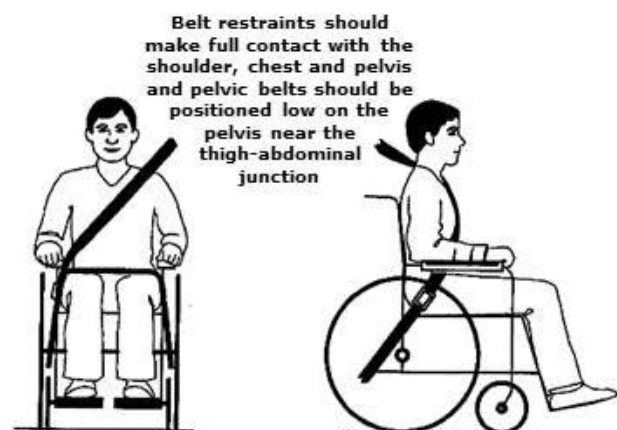
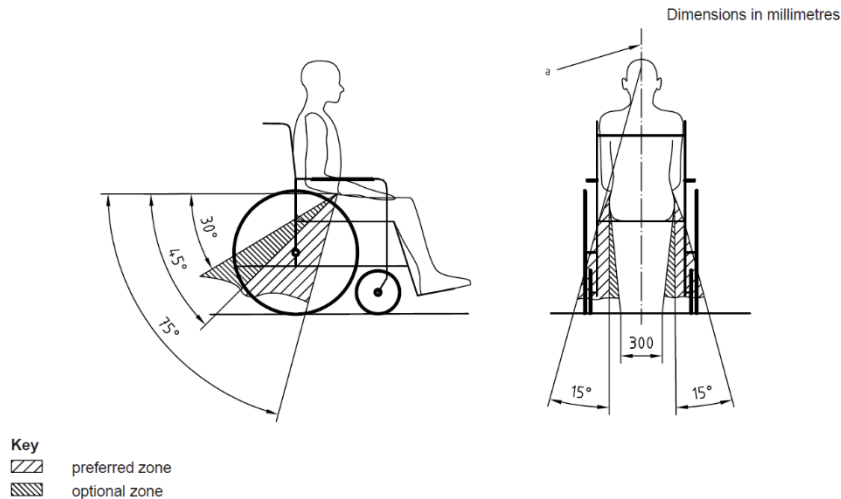


Illustration of proper belt-restraint fit

Positioning the occupant restraint when using it with a 4 point strap tie-down system:

Danger!

- The pelvic restraint belt must be worn low across the front of the pelvis so that the angle of the pelvic belt is within the optional or preferred zone of 30° to 75° to the horizontal. A steeper (greater) angle within the preferred zone, 45° to 75° is desirable i.e. closer to, but never exceeding 75° degrees.

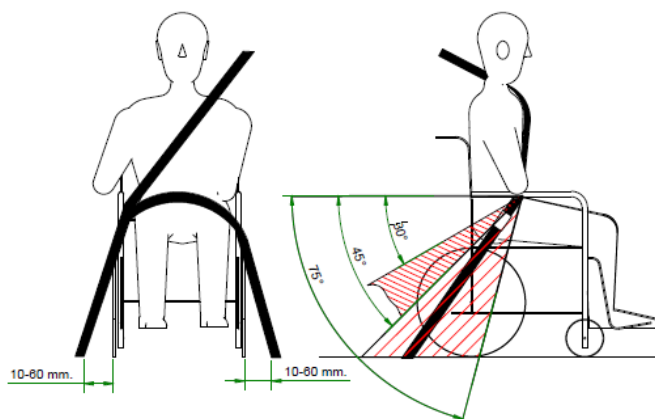


Preferred and optional angles for location of the lap belt when using 4 point strap tie downs

Positioning the occupant restraint when using Dahl Docking systems only:

Danger!

When using wheelchair with Dahl Docking systems, the floor anchorage points for the occupant restraint system should be located 10-60 mm outside wheels, on each side. The pelvic belt must be worn low across the front of the pelvis so that the angle of the pelvic belt is within the optional or preferred zone of 30° to 75° as shown. A steeper (greater) angle within the preferred zone, 45° to 75° is desirable i.e. closer to, but never exceeding 75° degrees.



Preferred and optional angles for location of the lap belt when using a docking station

13.3.3 Securing the wheelchair with a Dahl docking station

The **LEVO C³** is approved for use with 2 docking stations from Dahl Engineering: Dahl Docking Mk II and Dahl VarioDock™.

Content of Dahl docking station MK II kit #501750:



Content of Dahl VarioDock™ kit #503600:



Fitting of the Dahl lock plate on the wheelchair

In order to fit the Dahl Lock plate an additional wheelchair specific adaptation kit is required to anchor the lock plate to the battery box. The lock plate and adaptation kit used is identical for both Dahl docking Mk. II and Dahl VarioDock™.

1. Place nuts in predrilled holes in the battery box with the recess down.
2. Fit the 8 mm spacer onto lock plate and put the five bolts (Dahl #502800) through the lock plate and 8 mm spacer.
3. Mount the bolts in the nuts and tighten to a torque of 16-18 Nm.



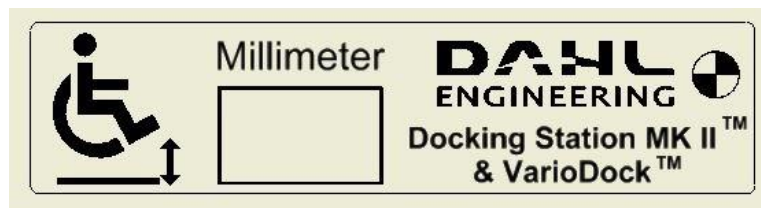
WARNING!

Do not use bolts other than those supplied from Dahl Engineering (#502800 which are quality 14.9, Torx key size 27). Standard countersunk M8 bolts will not be strong enough in the event of a collision.

4. Cut off any excess thread. It is very important that the fitter checks that the length of the bolts are correct. If bolts are made too short to reach through all threads in the nuts – they will not have the strength to carry the load required. If bolts are made too long the batteries or other wheelchair components can be damaged. If bolts are cut too short replace them with original Dahl bolts #502800 only.
5. Apply Loctite 222 (or an equivalent product) onto threads on all bolts.
6. Place plastic spacers, as shown inside the battery box, to avoid batteries coming into contact with the nuts and bolt ends.
7. Perform final check by connecting the wheelchair to the docking station. Make sure that lock plate is securely locked and that all release methods work as intended.
A warning tone will sound if lock plate is not properly engaged.

Identifying wheelchairs with Dahl Docking locking plate installed

If the wheelchair is equipped with the locking plate for the Dahl Docking systems MK II and VarioDock™, the following label is present on the backrest of the wheelchair.



Important note for the installer!

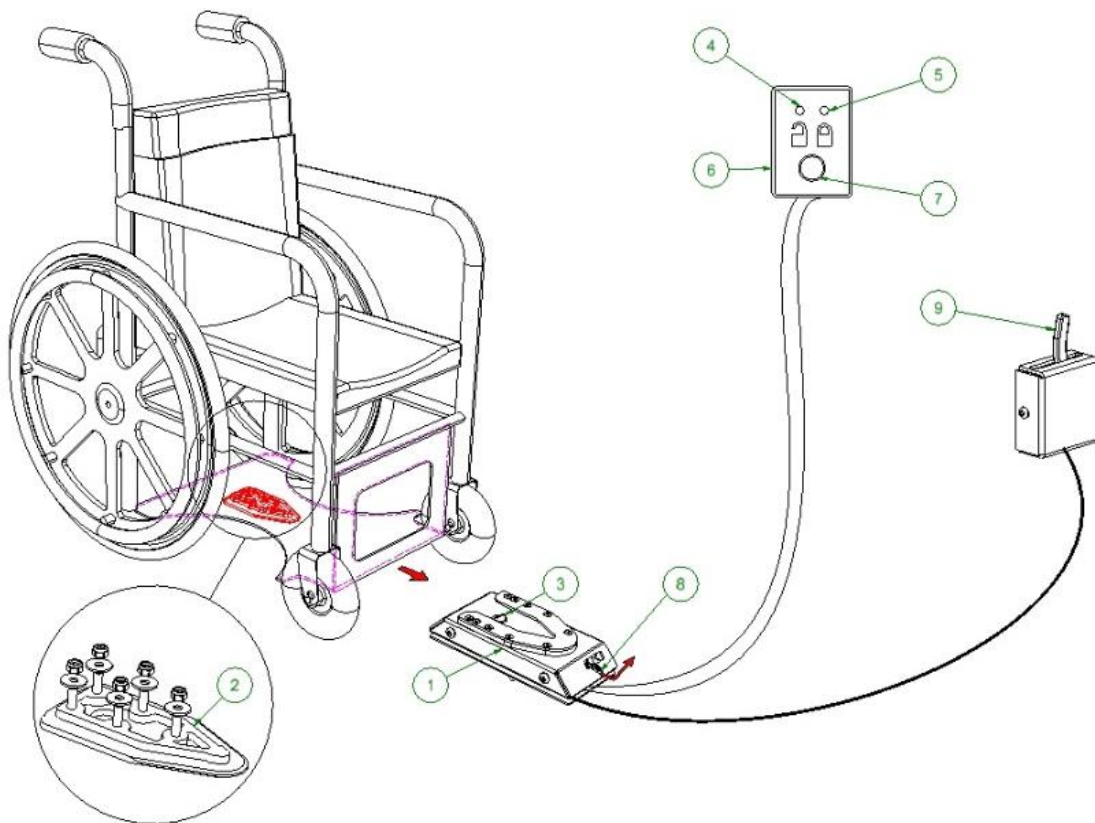
The value noted on the label expresses the wheelchair’s ground clearance (minus 1-2 mm). For the power height adjustable VarioDock™ this is the height that the display must be set to. For the MK II this is the final height that the docking unit must be installed at. Failure to set/install the docking unit to the correct height might impede the locking plate from sliding smoothly into the docking unit, or prevent the Docking station and wheelchair from connecting altogether.

The installer of the locking plate must measure the ground clearance after installation and note the final height on the label. Measurement must be taken with the user seated in the wheelchair. Also make sure that the wheels are inflated to the correct tire pressure.

Finally, the label has to be attached to a location that is readily visible to a driver or an assistant.

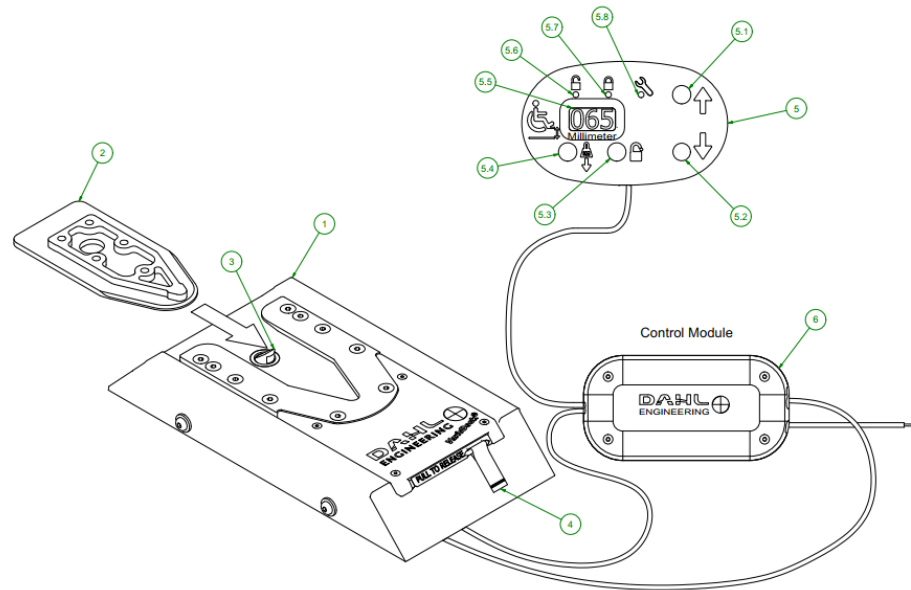
Please refer to the Dahl Docking Station user and installation instructions for further detail

Description of how the Dahl Docking system Mk II. functions



1. Dahl Docking station MK II
2. Lock plate and spacer
3. Lock pin
4. Red LED
5. Green LED
6. Control panel
7. Release button
8. Manual emergency release lever
9. manual operating lever

Description of how the Dahl VarioDock™ functions



1. Dahl VarioDock™
2. Lock plate and spacer
3. Lock pin
4. Manual emergency release lever
5. Control panel
 - 5.1. Adjust upwards (yellow button)
 - 5.2. Adjust downwards (green button)
 - 5.3. Release button (red button)
 - 5.4. Pull down to remove slack (blue button)
 - 5.5. Current measurement display
 - 5.6. Red indicator LED (wheelchair NOT secured, can be removed from docking station)
 - 5.7. Green indicator LED (wheelchair IS secured)
 - 5.8. Illuminated when maintenance required
6. Control module

The Dahl VarioDock™ (1.) is designed to retain manual and electric wheelchairs, as well as Dahl's seat bases in the vehicle's floor. A control module (6.) controls and monitors Dahl VarioDock™'s features, distributes power to the various components, as well as receiving and sending signals to and from the control panel. Wires are included. Do not carry out any modifications to the supplied wiring or other components. A lock plate and an 8mm spacer (2.) must be fitted under the wheelchair. When the wheelchair is manoeuvred towards the VarioDock™, the wheelchair is guided into place by means of the lock plate. When the lock plate is fully engaged in the VarioDock™, a spring-loaded lock pin (3.) automatically secures the lock plate. VarioDock™ is equipped with a built-in control switch that indicates whether the lock plate is correctly secured in the VarioDock™. As soon as the lock plate comes into contact with the locking pin, a warning tone will sound (a high-pitched alarm sound), and the red LED (5.6.) in the control panel will light up until the lock plate is either fully engaged or else the wheelchair is removed from the VarioDock™. With the wheelchair correctly secured, the warning tone stops and the green LED (5.7.) in the control panel will light up to indicate, that the wheelchair is properly secured. The control panel (5.) (see descriptions of control panel's functions on page 15) is connected to an electromagnet which triggers/releases the lock pin for approx. 5 or 8 seconds, after which it is automatically locked once more.

In case of an electrical fault, there is a manual emergency release (4.) on the front edge of the VarioDock. The release arm should be pushed sideways and held in order to release the wheelchair. You can also use the emergency release tool, which is delivered with the VarioDock™. Fixation parts in the form of bolts, nuts, washers, etc., are included.

Securing the wheelchair in the docking station:

1. Maneuver the wheelchair slowly and in a uniform direction over the docking station. The lock plate under the wheelchair helps to guide the wheelchair into place in the docking station. When the lock plate is fully engaged in the docking station, a spring-action locking pin automatically secures the lock plate.
2. The docking station is equipped with a control switch that indicates whether the lock plate is correctly secured in the docking station. As soon as the lock plate comes into contact with the locking pin, a warning tone will sound (a high-pitched howl), and the red diode/lamp (LED) in the control panel will light up until the lock plate is either fully engaged or else the wheelchair is removed from the docking station.
3. As an indication that the wheelchair is properly secured, the warning tone will cease, the red lamp (LED) in the control panel will go out and the green lamp (LED) will light up.
4. Do not forget to buckle up for driving.

Warning!



Do not move the vehicle:

- Whilst the wheelchair is being maneuvered into position in the docking station.
- If the wheelchair and user are not correctly secured.
- If the warning tone sounds and/or the red warning lamp (LED) in the control panel flashes or is lit!

Always check if the lock plate is properly engaged in the docking station by trying to reverse the wheel chair out of the docking station before moving the vehicle. (It must not be possible to reverse out of the docking station without pressing the red release button in the control panel).

Release from the docking station:

1. When the vehicle has been brought to a halt, remove the safety belt.
2. To unlock commence by driving the wheelchair forward to release pressure on the lock pin.
3. Press the red release button in the control panel. The locking pin will be triggered/ released for approx. 5 seconds, after which the locking pin is automatically locked/activated again.
4. Move the wheelchair away from the docking station within this 5-second period. Do not attempt to reverse out of the docking station until the red LED on the control module, which indicates the unlock position, has been illuminated.

Warning!

Attempting to reverse the wheelchair before the red LED has been illuminated will result in blocking the docking stations locking mechanism, which makes it impossible to reverse. If this happens repeat above unlocking procedure.



Manual release in case of electric failure

A manual emergency release is located at the front edge of the docking station.

1. Move wheelchair forward to remove the pressure on the lock pin and push the red release arm to one side and hold it there while the wheelchair moves away.
2. A cable-activated manual operating lever can also be fitted (accessory). The red release arm is also pushed to one side and should be held there whilst the wheelchair moves away.

If the described manual release procedures fails, an emergency release tool made from red plastic comes with each docking station.



(Illustration of manual wheelchair and not **LEVO LCM2** for purposes of clarity)

1. Move wheelchair forward to remove the pressure on the lock pin.
2. Place the emergency release tool in the gap between the locking plate and the docking station.
3. Push the release tool and wheelchair forward until the locking pin has been forced down - after which the wheelchair can reverse out of the docking station.

Installation of Dahl Docking systems in the vehicle:

Only professional companies in the business of converting or building wheelchair accessible vehicles can order the docking system from Dahl Engineering. A qualified and experienced technician must carry out the installation. Dahl Engineering can provide vehicle specific installation instructions for a large range of vehicles, which must be respected by the fitter.

Please also refer to Dahl Engineering instructions for installation, use and maintenance for the system used.

Contact Dahl Engineering for further information about approved vehicles and fitting positions. Contact details are available at: www.dahlengineering.dk

13.3.4 Transport Information and Specification in Aircrafts and for Airfreight

Transport Information and Specification in Aircrafts and for Airfreight, please note the separate available Transportation Instruction LEVO Models.

This Instruction will answer all questions according to the IATA Regulations like

- Dangerous Goods Regulation
- Battery-Powered Wheelchair and Mobility Aid Guidance Document
- Transport of Battery-Powered Wheelchair and Mobility Aid Carried by Passengers
- Lithium Ion Battery-Powered Wheelchair and Mobility Aid etc.



Battery-Powered Wheelchair and Mobility Aid Guidance Document

Transport of Battery-Powered Wheelchair and Mobility Aid Carried by Passengers



Dangerous Goods Regulations

TABLE 2.3.A
Provisions for Dangerous Goods Carried by Passengers or Crew
(Subsection 2.3)

Dangerous goods must not be carried in or as passengers or crew, checked or carry-on baggage, except as otherwise provided below. Dangerous goods permitted in carry-on baggage are also permitted "on one's person", except where otherwise specified.

The pilot-in-command must be informed of the location				
Permitted in or as carry-on baggage				
Permitted in or as checked baggage				
The approval of the operator is required				
Alcoholic beverages, when in retail packagings, containing more than 24% but not more than 70% alcohol by volume, in receptacles not exceeding 5 L, with a total net quantity per person of 5 L.	NO	YES	YES	NO
Note: <i>Alcoholic beverages containing 24% or less alcohol by volume are not subject to any restrictions.</i>				
Ammunition, securely packaged (in Div. 1.4S, UN 0012 or UN 0014 only), in quantities not exceeding 5 kg gross weight per person for that person's own use. Allowances for more than one person must not be combined into one or more packages.	YES	YES	NO	NO
Avalanche rescue backpack, one (1) per person, containing cartridges of compressed gas in Div. 2.2. May also be equipped with a pyrotechnic trigger mechanism containing no more than 200 mg net of Div. 1.4S. The backpack must be packed in such a manner that it cannot be accidentally activated. The airbags within the backpacks must be fitted with pressure relief valves.	YES	YES	YES	NO
Baggage with installed lithium batteries non-removable batteries exceeding 0.3 g lithium metal or 2.7 Wh.	FORBIDDEN			
Baggage with installed lithium batteries: non-removable batteries. Batteries must contain no more than 0.3 g lithium metal or for lithium ion	NO	YES	YES	NO



2024 Lithium Battery Guidance Document

Transport of Lithium Metal and Lithium Ion Batteries

Revised for the 2024 Regulations

14. Cleaning

- Whenever the wheelchair gets dirty it should be cleaned using a damp cloth and then dried thoroughly.
- For more stubborn stains wipe with a damp cloth using a mild solution of warm water and a mild cleansing agent.
- Never use furniture polish, spirit or solvents to clean the frame.
- In case of dirt on the seat cushion cover or the back rest cover, you can remove them and wash them carefully. Do not wash warmer than **40 degree Celsius or according to the cleaning instructions on the label inside the cushion cover.**

Caution: Never use high-pressure water cleaner.

15. Maintenance

15.1. Service

The **LEVO C³** is designed to be maintenance free and, apart from the items mentioned below, does not require attention from the user.

Please note that to maintain safe and efficient operation, the wheelchair should be serviced at least once per year by your LEVO agent or authorized dealer. This annual service has to be filled into the service card from the agent/dealer.

The user or their family should carry out the following tasks.

- Keep the wheelchair clean.
- Never store the wheelchair when damp.
- Keep the batteries charged to the maximum.
- Check that all fittings, harness, etc. are working properly (chapter 9 and 11).
- Check operation of motor disengaging lever weekly.
- Check operation of all controls daily.
- If any faults are found, report them immediately to your agent. He will advise you whether to continue using the wheelchair or not, and what action you should take to repair the wheelchair.

15.2. Safety checks

The electronic circuits in your control system have been designed to be extremely safe and reliable. The on-board microcomputer carries out safety checks at up to 100 times per second. To supplement this safety monitoring you should carry out the following periodic checks.

If the control system fails any of these checks, do not use the wheelchair and contact your service agent.

15.2.1. Daily checks

Joystick: With the control system switched off, check that the joystick is not bent or damaged and that it returns to the center when you push and release it. If there is a problem, discontinue the safety checks and contact your service agent.

15.2.2. Weekly checks

Solenoid (parking) brake:

This test should be carried out on a level floor with at least one meter clear space around the wheelchair.

- Switch on the control system.
- Check that the battery gauge remains on, or flashes slowly, after one second.
- Push the joystick slowly forwards until you hear the parking brakes operate.
The chair may start to move.
- Immediately release the joystick. You must be able to hear each parking brake operate within a few seconds.
- Repeat the test a further three times, pushing the joystick slowly backwards, left and right.

Connectors:	Make sure that all connectors are securely in place.
Cables:	Check that all cables and connectors are undamaged.
Joystick gaiter:	Check the thin rubber gaiter or boot around the base of the joystick shaft for damaged or splitting. Check visually only. Do not handle the gaiter.
Mounting:	Make sure that all the components of the control system are securely mounted (without overtightening any securing screws.)

15.3. Spare parts

LEVO AG delivers single parts or modules as spare parts. Your distributor can provide all spare parts listed for your **LEVO C³**. It is also possible to order a spare part list from **LEVO AG** directly.

16. Disposal

Wheelchair:

Return the wheelchair after the product lifetime to the point of sale. The dealer will dispose of it according to local regulations.

Some countries/insurers require that wheelchairs are returned through the dealer network for reuse if the product is not life expired.

Batteries:

Return old batteries to the point of sale of the wheelchair or of the batteries. The dealer will dispose of them according to local regulations. Remove the batteries especially carefully. If the casing is damaged, there is risk of a chemical burn. Contact your **LEVO** dealer if in doubt.

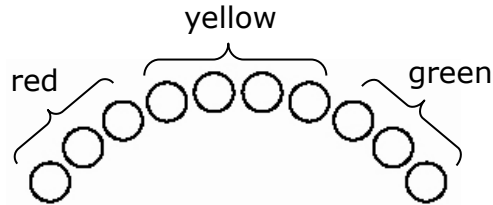
17. Trouble shooting

If you have problems with your wheelchair check this list before calling your local agent.

ITEM	PROBLEM	Solution
Joystick Module	Battery level indicator does not light	<ul style="list-style-type: none"> • Switch on ON/OFF switch • Insert fuse / switch on safety cut out • Unplug charging plug • Replace battery • If above does not work consult LEVO agent
	Battery level indicator flashes slowly	<ul style="list-style-type: none"> • Charge Battery
	Battery level indicator blinks every 2.5 Seconds	<ul style="list-style-type: none"> • Joystick module in sleep mode. To restart switch off then on again
	Battery level indicator flashes rapidly	<ul style="list-style-type: none"> • See chapter 18
Driving	Will not drive in a straight line	<ul style="list-style-type: none"> • Consult LEVO agent
	Motors turn and battery level indicator lights up but chair does not drive	<ul style="list-style-type: none"> • Push motor disengaging lever upwards • Charge batteries
Battery charger PF 2408	LED flashes red	<ul style="list-style-type: none"> • Wrong battery polarity • Consult LEVO agent
	LED lights orange	<ul style="list-style-type: none"> • Charger not connected • Connect battery
	LED flashes red	<ul style="list-style-type: none"> • Wrong battery polarity • Consult LEVO agent
	LED lights orange	<ul style="list-style-type: none"> • Charger not connected • Connect battery
	LED flashes red	<ul style="list-style-type: none"> • Wrong battery polarity • Consult LEVO agent
	LED lights orange	<ul style="list-style-type: none"> • Charger not connected • Connect battery
	LED flashes red	<ul style="list-style-type: none"> • Wrong battery polarity • Consult LEVO agent

18. Controller self help guide VR2

The battery indicator provides information in case a fault occurs to the wheelchair's electrical system. An appropriate number of lights flash rapidly on the display for a particular fault. Please see below.

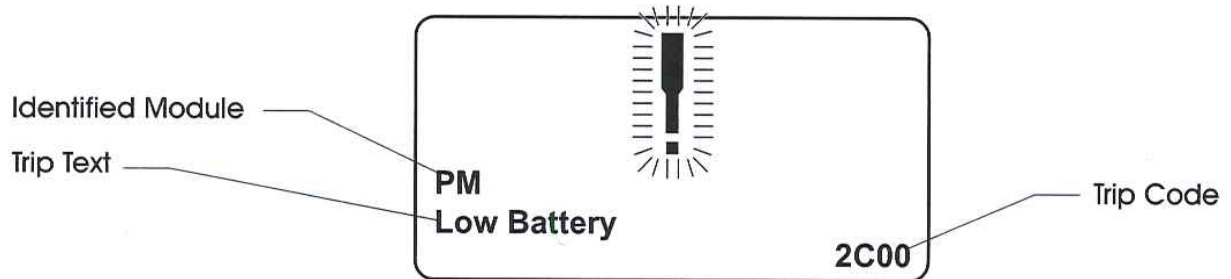


Lights flashing		
10 green	High battery voltage	An excessive voltage has been applied to the control system. This is usually caused by a poor battery connection. Check battery and power module connections. If the fault remains contact your local agent.
9 green	Solenoid brake fault	The parking brakes have a bad connection. Make sure all connectors are plugged in properly. If the fault remains contact your local agent
8 green	Possible power module fault	A Power Module fault is indicated. Make sure all the power module connections are pushed in properly.
7 yellow	Possible joystick module fault	A joystick fault is indicated. Make sure the joystick is in the rest position before switching on.
6 yellow	Charger connected	The battery charger is plugged into the wheelchair. Unplug the charger from the joystick module.
5 yellow	Right motor wiring fault	The right-hand motor has a short circuit to a battery connection. Contact your local agent.
4 yellow	Right motor disconnected	The right-hand motor has a bad connection. Make sure the motor connector is plugged in properly.
3 red	Left motor wiring fault	The left-hand motor has a short circuit to a battery connection. Contact your local agent.
2 red	Left motor disconnected	The left-hand motor has a bad connection. Make sure the motor connector is plugged in properly.
1 red	Low battery voltage	The battery needs charging or there is a bad connection in the battery. Check connections to the battery, power module and joystick module.

Please contact your local specialist if advice above does not solve the problem. Please provide your specialist with the serial number of your **LEVO C³** which is noted on the warranty card. This number might be important in case of questions to the manufacturing company **LEVO AG**.

19. Controller self help guide R-net

The joystick module has its own error-management-system. If an error occurs, a message is indicated on the display. Example below:



If you can't solve the problem, with the displayed message, you can enter the trip code on the PG Drives homepage (<http://www.pgdt.com/diagmob/diagnostic.asp>). There you will normally get some more information about the error and how you can solve it. If you can't solve the problem, please get in touch with your **LEVO** dealer.

20. Technical Information

Model	LEVO C ³		
Wheelchair category	B		
Seat width	320 – 520 mm		
Overall width	630 mm		
Overall length (without footplate)	1050 mm		
Overall length (with footplate)	1050 mm		
Overall height, incl. backrest	1000 mm		
Backrest	V-Trak 40cm (or any other optional heights)		
Seat height (incl. Seat cushion)	Min. 480 mm		
Seat depth	380 – 660 mm		
Footrest to seat distance	Min. 240 mm – Max. 500 mm		
Armrest to seat distance	Min. 170 mm – Max. 260 mm		
Front location of armrest structure	Max. 400 mm		
Seat plane angle	Min. 3.6° - Max. 31.4°		
Backrest angle	Min. 0° - Max. 25°		
Leg to seat surface angle	Min. 90° - Max. 180°		
Horizontal location of axle	Max. 160 mm		
Type of tire	breakdown safe, without air		
Size of tire	front 2.80/2.50-4"	middle 3.00-8"	back 7x1 3/4"
Max. weight	185 kg		
Max. total load	140 kg		
Speed	0-10 km/h		
Turning diameter	1100 mm		
Nominal Gradient in sitting position	Max. 10°		
Nominal Gradient in standing position	Max. 3°		
Dynamic stability uphill	Max. 6°		
Curb climbing ability (sitting position)	8 cm		
Curb climbing ability (standing position)	2 cm		
Battery charger	Brand: PowerFirst PF2408 – 100-240VAC 50/60 Hz		
Joystick module	PG Drives VR2 90A or R-net 120A		
Programming of driving characteristics	Standard for trained Fun for experts		
Colour	Standard: RAL-colours yellow / red / blue / black		

Battery Types	MK Battery 45HR2000S-MK	MK Battery M24 SLD G FT
Voltage	12 V	12 V
Capacity	48 Ah	73 Ah
Dimensions in mm (L x W x H)	230x140x205	260x170x205
Quantity built in chair	2	2
Range	25 km	35 km

The wheelchair conforms to the following standards:

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

21. Version Management

Version- No.	Date	Description	Author
1.0	2008-07-10	First released version	T. Meier
1.1	2008-11-19	Additions for aid numbers	T. Meier
1.2	2008-12-09	Additions for Handicap Institute	T. Meier
1.3	2009-02-05	Miscellaneous changes in chapters	T. Meier
1.4	2009-02-24	Additions for the R-net control system	T. Meier
1.5	2010-01-01	Miscellaneous changes in chapters	T. Räber
1.6	2010-07-23	Additional in safety instructions	H. Bögli
1.7	2011-04-01	New main fuse version	H. Bögli
1.8	2012-04-12	Improvements	H. Bögli
1.9	2014-05-23	Declaration of Conformity – Status TÜV Renewal Certification – Technical information	H. Bögli
2.0	2018-05-28	TÜV Update	H. Bögli
2.1	2020-03-03	TÜV Update	J. Carmichael
2.2	2021-01-29	Update for MDR and ISO7176-19	J. Carmichael
2.3	2021-03-22	Authorised Representative added	J. Carmichael
2.4	2021-05-26	MDR Adjustments - Warning text	J. Carmichael
2.5	2021-06-30	EU Single Registration Number SRN	H. Bögli
2.6	2022-02-22	Adjustment ISO 7176/19 according ISO 17025	JC
2.7	2024-06-30	Update 13. Transportation	H. Bögli