



 **POWERED PULLING DEVICE**

000690855.01

Empulse F55

Directions for use

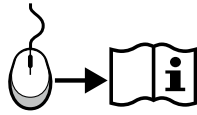


If you are visually impaired, this document can be viewed in PDF format at www.SunriseMedical.co.uk.

Add-on Bike Components

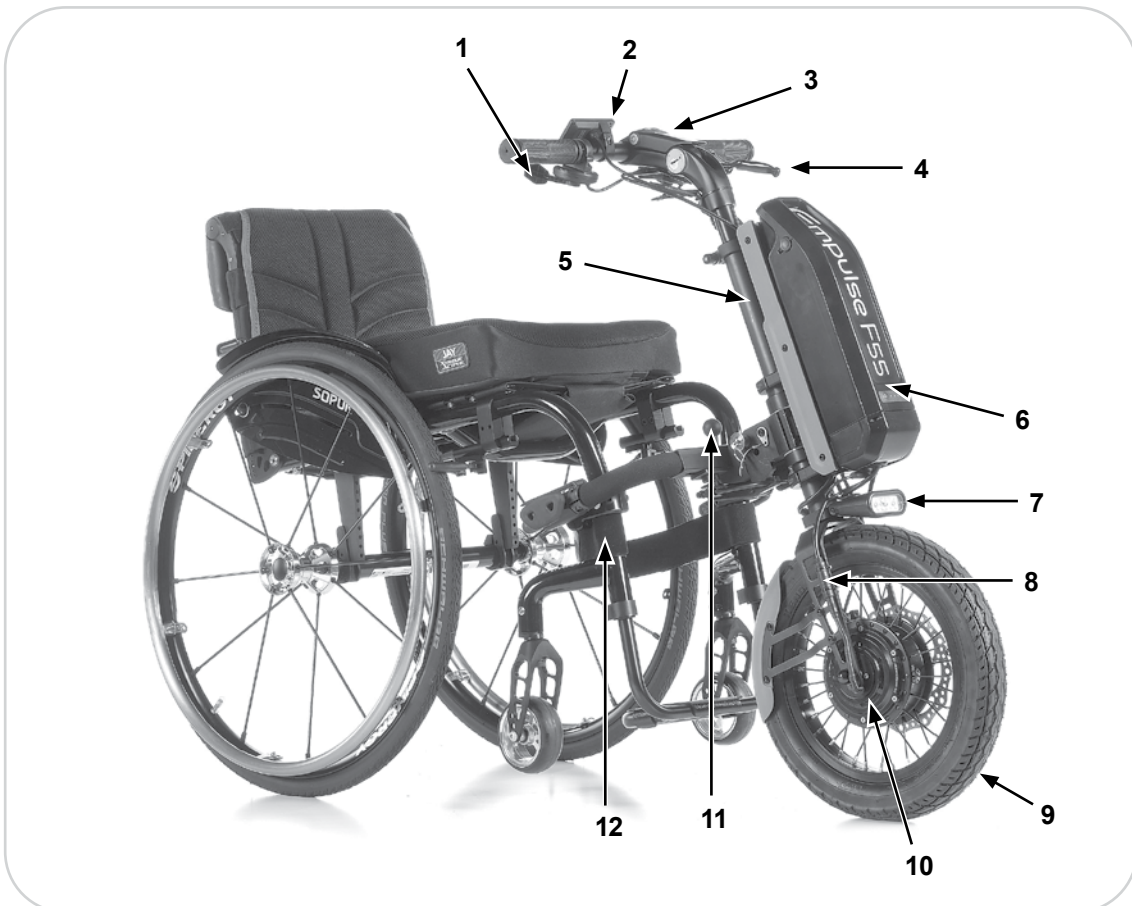
EN 

We at SUNRISE MEDICAL have been awarded the ISO-13485 certificate, which affirms the quality of our products at every stage, from R & D to production. This products meet the requirements in accordance with EC regulations. Options or accessories shown are available at extra cost.



EN 04





1. Throttle
2. Display
3. Handlebar
4. Brake Lever
5. Frame
6. Battery
7. Lights
8. Fork
9. Front wheel
10. Hub motor
11. Quick-release lever
12. Docking clamps



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Definitions of words used in this manual

Word	Definition
 DANGER!	Advice to the user of Potential Risk of serious injury or death if the advice is not followed
 WARNING!	Advice to the user of a risk of injury if the advice is not followed
 CAUTION!	Advice to user that potential damage to equipment may occur if the advice is not followed
NOTE:	General advice or best practice
	Reference To Additional Documentation

NOTE:

- Please keep a note of your local service agent's address and telephone number in the space provided.
- In the event of a breakdown, contact them and try to give all relevant details so they can help you quickly.
- The pulling devices shown and described in this user guide may not correspond in every detail exactly to your own model. However, all instructions are completely relevant, regardless of possible detail differences.
- The manufacturer reserves the right to alter without notice any weights, measurements or other technical data shown in this manual. All figures, measurements and capacities shown in this manual are approximate and do not constitute specifications.

Dealer signature and stamp

Foreword

Dear Customer,


We are very happy that you have decided in favour of a high-quality product from SUNRISE MEDICAL.

This owner's manual will provide numerous tips and ideas so that your new pulling device can become a trustworthy and reliable partner in your life.

For Sunrise Medical, it is very important that we have a good relationship with our customers. We like to keep you up-to-date about new and current developments at our company. Keeping close to our customers means: fast service, as little red tape as possible, working closely with customers. Whenever you need replacement parts or accessories, or if you just have a question about your pulling device – we are there for you.

We want you to be satisfied with our products and service. At Sunrise Medical we are constantly working to develop our products further. For this reason, changes can occur in our range of products with regard to form, technology, and equipment. Consequently, no claims can be construed from the data or pictures contained in this user's manual.

The management system of SUNRISE MEDICAL is certified to EN ISO 9001, ISO 13485 and ISO 14001.

 **As the manufacturer, SUNRISE MEDICAL, declares that the pulling devices conform to the Medical Device Regulation (2017/745).**

NOTE:

General user advice.

Not following these instructions may result in physical injury, damage to the product or damage to the environment!

Notice to the user and/or patient: Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

B4Me special adaptations

Sunrise Medical strongly recommends that in order to ensure that your B4Me product operates, and performs as intended by the manufacturer; all the user information supplied with your B4Me product is read and understood, before the product is first used.

Sunrise Medical also recommends that the user information is not discarded after reading it, but it is kept safely stored for future reference.

Medical Device Combinations

It may be possible to combine this Medical device with one or more other Medical Device or other product. Information on which combinations are possible can be found at www.Sunrisemedical.co.uk. All combinations listed have been validated to meet the General Safety and Performance Requirements, Annex I Nr. 14.1 of the Medical Device Regulation 2017/745.

Guidance on the combination, such as mounting, can be found within this manual.

Please contact your local, authorised SUNRISE MEDICAL dealer if you have any questions regarding the use, maintenance or safety of your pulling device.

In the case of there being no authorised dealer in your area and you have any questions regarding product safety or recalls, contact Sunrise Medical either in writing or by telephone.

Sunrise Medical

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Do not use your pulling device until this manual has been read and understood. Please follow the instructions contained within the Owner's Manual.

The Empulse F55 is a powered pulling device, which is attached to a wheelchair, to support the mobility and integration of the wheelchair user in daily life. It is designed for personal use indoors or outdoors.

The maximum user weight (including both the user and any weight of accessories fitted to the pulling device) is marked on the serial number label. The serial number label is located on the frame as well as in the owner's manual.

Warranty can only be taken on if the product is used under the specified conditions and for the intended purposes.

Service life

The expected life of the pulling device is 5 years, provided that:

- It is used in strict accordance with the intended use.
- All service and maintenance requirements are fulfilled.

DANGER!

- Do not fit any unauthorized electronic equipment.

The pulling device provides the user with the potential to safely cover long distances in an ergonomically and ecologically efficient manner, using their own wheelchair. It expands the activity radius significantly.

The attached wheelchair must be equipped in accordance with road traffic regulations when used on public roads, pavements and spaces.

Indications

The adjustability, as well as the modular design, mean that it can be used by those who cannot walk or have limited mobility because of:

- Paralysis
- Loss of extremity (leg amputation)
- Extremity defect deformity
- Joint contractures/joint injuries
- Illnesses such as heart and circulation deficiencies, disturbance of equilibrium or cachexia as well as for elderly people who still have strength in the upper body.

Contraindications

The electrical pull devices and add on bikes shall not be used in case of:

- Perception disorder
- Imbalance
- Loss of both arms
- Joint contracture or joint damage on both arms
- Seating disability
- Physically and mentally not capable of safely operating the pull device and add on bike in all operating situations (steering, braking, ..)
- Not meeting the legal requirements for use on public roads.

Operating Conditions

The pulling device should be able to cope with tarmac surfaces and firm paths with different topography. Avoid driving on unpaved or loose surfaces (e.g. on loose gravel, in sand, mud, snow, ice or through deep puddles of water), as this may expose the user to unforeseen risks.

We herewithin advise, that using the Empulse F55 with max. speed-settings higher than 6 kph is only permitted on public roads in certain countries and otherwise may only be used on private property.

In the absence of approval, in accordance with the road traffic laws, the Empulse F55 may not be driven on public roads, bicycle-lanes and pavements. You need to inform yourself about the country specific legislation regarding usage and your legal obligation to insure the Empulse F55.

When you're travelling with your F55, always check the specific legislation in the respective country.

1.0 General safety notes and Driving limits

The technology and construction of this pulling device have been designed to provide maximum safety. International safety standards currently in force have either been fulfilled or exceeded in parts. Nevertheless, users may put themselves at risk by improperly using their pulling device. For your own safety, the following rules must be strictly observed. Unprofessional or erroneous changes or adjustments increase the risk of accident. As a pulling device user, you are also part of the daily traffic on streets and pavements, just like anyone else. We would like to remind you that you are therefore also subject to any and all traffic laws.

Be careful during your first ride with this pulling device. Get to know your pulling device.

WARNING!

- Exceeding the maximum load can lead to damage to the pulling device, loss of control, or serious injury to the user and other people.
- Exercise caution when using the pulling device. For example, avoid negotiating obstacles such as, steps, curbs, path edges or dropping down gaps without slowing down or braking first.
- The pulling-device is not tested and approved according to ISO 7176-19. It is therefore not allowed to transport the user in the wheelchair with the F55 docked in a car. When transporting a combined unit made up of a pulling device and wheelchair vehicle, the user must transfer onto the vehicle seat and must not sit on the combined unit. The combined unit itself (without user) must be tied down during transportation and secured against slipping.
- This pulling device should be used exclusively to convey one person at a time. Any other use does not comply with the intended purpose.
- Use of the pulling device is only recommended for those who have the right physical and psychological constitution to be able to cope with public traffic.
- Please note that you are subject to any and all traffic laws when riding in public traffic.
- As a beginner, you should ride particularly carefully at first.
- Familiarise yourself with the braking distances from various speeds.
- Familiarise yourself with the general traffic laws!
- In order to achieve a stable ride when travelling straight ahead, wherever possible, you should avoid hasty steering movements when travelling at speed or going round corners.
- A three-wheel vehicle is never as stable as a four-wheel vehicle and it may tip over as a result of sudden manoeuvres or going round bends too quickly.
- When you are riding, braking or manoeuvring, always hold the handlebars firmly with both hands. Failure to do so could increase the risk of an accident through steering error.
- The speed must be adjusted to suit the technical capabilities of the bike, terrain and operator.
- At night and dawn/dusk, always use the lights.
- Only ride on asphalt paths, or firm, smooth surfaces.
- Use caution when riding over curbs, steps, potholes, etc. as there is an increased risk of tipping over.
- Adjust your method of driving to your capabilities.
- Ride slowly and carefully, particularly when riding round corners.
- Do not touch the motor, because it can get very hot.

- Your bike should be serviced by your dealer at regular intervals. (min. every year).
- As with all moving parts, there is a risk that fingers could become trapped. Please always handle carefully.
- If the traction device is subject to direct sunlight / external heat sources or low temperatures for long periods, parts of your pulling device could become very hot (>41°C) or very cold (<0°).
- The pulling device should not be used in stormy conditions, heavy rain/snow or on slippery or damaged surfaces.
- You should only use product combinations which have been approved by Sunrise Medical.
- The standard version of your pull device has been tested on the applicable requirements with respect to electromagnetic radiation (EMC requirements) In spite of these tests:
 - It cannot be excluded that electromagnetic radiation may have an influence on the pull device. For example:
 - mobile telephony
 - large-scale medical apparatus
 - other sources of electromagnetic radiation
 - It cannot be excluded that the pull device may interfere with electromagnetic fields. For example:
 - shop doors
 - burglar alarm systems in shops
 - garage door openers
- In the unlikely event that such problems do occur, we request that you notify your dealer immediately.

DANGER!

CHOKING HAZARD – This mobility aid uses small parts which under certain circumstances may present a choking hazard to young children. The pull device shown and described in this user guide may not correspond in every detail exactly to your own model. However, all instructions are completely relevant, regardless of possible detail differences.

NOTE: The pulling devices shown and described in this user guide may not correspond in every detail exactly to your own model. However, all instructions are completely relevant, regardless of possible detail differences. The manufacturer reserves the right to alter without notice any weights, measurements or other technical data shown in this manual. All figures, measurements and capacities shown in this manual are approximate and do not constitute specifications.

NOTE: We would like to point out that the versions of the pulling device which drive faster than 6 kph are only permitted in road traffic in certain countries and otherwise may only be used on private land. In the absence of approval, in accordance with the road traffic laws, the versions which drive faster than 6 kph version may not be driven on public roads or even cycle ways. It is your responsibility to find out the information about which legal regulations apply in your particular country and about the insurance or driving licence obligations for versions which drive faster than 6 kph.

If you order a version which has a speed of over 6 kph, please confirm this to Sunrise Medical with your signature, that you have understood this information and that we should deliver this version.

Safety instructions – prior to each ride.

CAUTION!

- Check the conditions of your wheels, (including the wheels of your wheelchair) visually, (spokes and rims, damages of tyres) as well as the pressure of the tyres. The correct air pressure is indicated on the tyre.
- Tyre pressure which is too low or too high will have a negative effect on the braking action, wear and tear and the driving performance.
- Always check that the tread depth of your tyres is Okay.
- Check that the brake works correctly. The pulling device may not be used if the brakes are not 100% functioning!
- Avoid damage to the Bowden cables. There is a risk of kinking the cable when you transfer to/from the device.
- Check the fork by visual inspection for damage (e.g. cracks and breakages)
- Check that all components, especially the bolts, are tight.
- Check that the handlebars are firmly fixed.
- Check the connection between the pulling device and your wheelchair. Clamping must be on the metal tube without any parts, (e.g. calf strap, frame protectors) in between.
- Check the frame and the components of your wheelchair for any damage, (e.g. cracks).
- Check that the lights are functioning and the reflectors are sound; they must be visible all the time during use.
- Ensure that your feet cannot slip off the foot plate of your wheelchair. Use a special fixing tool if necessary.
- Check all cables and electrical connections.
- Check that the battery is locked correctly and fully charged.
- Switch the battery on and check the light.
- Always wear a helmet.

Safety instructions – while driving

WARNING!

- Make yourself familiar with the device in flat terrain before driving up or down slopes.
- Always hold the handlebars with both hands firmly as otherwise, there is a high risk of an accident through steering error.
- Always adapt your speed to your driving capability and to the traffic - / terrain conditions
- Use particular caution when approaching stairs, edges, drops or other hazard areas.
- Reduce your speed to walking pace and lean your body inwards, when driving round a bend.
- When waiting e.g. at a pedestrian crossing, a traffic light, on hills or slopes or at ramps of any type, always activate the brake.
- Due to the increased turning circle, turning can be sometimes impossible e.g. in corridors and other confined spaces.
- Only use the defined brackets to fix objects, (additional weights, bike panniers)
- When driving on pedestrian areas, observe the maximum permitted speed (walking speed).
- Always follow the road traffic regulations when driving on public roads and footpaths.

- Avoid driving on unpaved or loose surfaces (e.g. on loose gravel, in sand, mud, snow, ice or through deep puddles of water).
- Avoid abrupt steering actions.
- Avoid driving in parallel to slopes.
- Avoid turning on slopes.
- On slopes the traction of the driving wheel is lowered and the braking effect is considerably reduced. The driving style and speed should be always adjusted so that the product can be safely stopped at all times.
- Towing or using a trailer is not permitted.
- Driving on stairs is not permitted.
- Obstacles e.g. curbs must be run over always frontal / rectangular with very low speed to avoid tipping over and potential injuries. The max obstacle height is 50 mm, but this depends on the distance from the castors to the ground.
- It must be avoided that any wheelchair components or parts of your body get trapped when driving over or passing obstacles. This could result in falls and serious injuries as well as damage to the product.
- When driving on wet surfaces, there is an increase slip hazard because the traction of the tyres is reduced. Adapt your driving style accordingly.
- Always use the main brake to slow down your pulling device.
- Sliding of the driving wheel during braking can be avoided by moving your body weight forward.
- Avoid strong braking actions while driving through bends.

Safety instructions - after your ride:

- Switch off the device immediately when it is not in use to avoid accidental operation / movements caused by accidentally touching the throttle.
- Switching off helps to preserve the battery charge.

Warranty conditions:

1. If a part or parts of the pushing aid require repair or exchange as a consequence of a manufacturing defect within 24 months after delivery to the purchaser, then the affected part or parts will be repaired or replaced for free. The warranty will only cover manufacturing defects.
2. To enforce the warranty, please contact the supplier of your device – e.g. the Sunrise Medical Approved dealership or Healthcare provider with the exact details of the nature of the difficulty. Should you be using the device outside the area covered by the Sunrise Medical customer service agent, repairs or replacement will be carried out by another agency as designated by the manufacturer. The device must be repaired by a customer service centre/dealer designated by Sunrise Medical.
3. For parts, which have been repaired or exchanged within the scope of this warranty, we provide a warranty in accordance with these warranty conditions for the remaining warranty period for the device in accordance with point 1).
4. For original spare parts which have been fitted at the customer's expense, these will have a 12 months guarantee, (following the fitting), in accordance with these warranty conditions.
5. Claims from this warranty shall not arise, if a repair or replacement of a product or a part is required for the following reasons:
 - a. Normal wear and tear, which include batteries, armrest pads, upholstery, tyres, brakes shoes, etc.
 - b. Any overloading of the product, please check the EC label for maximum user weight.
 - c. The product or part has not been maintained or serviced in accordance with the manufacturer's recommendations as shown in the user instructions and/or the service instructions.
 - d. Accessories have been used which are not specified as original accessories.
 - e. The product or part having been damaged by neglect, accident or improper use.
 - f. Changes/modifications have been made to the product or parts, which deviate from the manufacturer's specifications.
 - g. Repairs have been carried out, before our Customer Service has been informed of the circumstances.
6. This guarantee is subject to the law of the country in which the Sunrise Medical product was purchased. * Means the Sunrise Medical facility from which the product was purchased.

Liability

If the pulling device:

- Is handled improperly
- Is not maintained in accordance with the maintenance schedule
- Is commissioned and used contrary to the instructions in this manual
- Has had repairs or other works carried out by non-authorized persons, or third-party parts installed or connected without prior agreement with Sunrise Medical, then Sunrise Medical is not responsible for the safety of the pulling device.

3.0 Handling

Delivery:

Your new pulling device is delivered fully assembled in a cardboard box. In order to avoid any damage during transportation, loose parts or parts to be fitted, are packed separately in the cardboard box.

Unpacking:

- Check the shipping cardboard box for external damage which may have been caused during transportation.
- Remove all packaging material.
- Take the pulling device carefully out of the box and check that it is complete.
- Check all parts for surface damage, scratches, cracks, dents, distortions and other defects.
- The scope of delivery consist usually of the pulling device:

Connecting frame with complete docking system, display, front light, lithium-ion battery and charger as well as 4 colour kits which contain the relevant mudguard and side bars (the black kit is fitted).

Fitting the display:

The display has been specifically programmed for your pulling device and is delivered with the pulling device. Fit the display as follows:

- undo the gripper clamp of the display and position it between the throttle and stem round the handlebar. Tighten the clamp screw in order to fix the display.
- Connect the plug of the display to the free plug connection on the pulling device. The plug is protected against polarity reversal and can only be plugged in one way. Make sure that you do not damage the pins in the plug during installation.

NOTE: Should you find any damage, or if any parts are missing please let us know immediately.

CAUTION!

- The pulling device may only be used with the delivered docking system and the appropriate frame clamps for your wheelchair. The pulling device must be handed over ready to use from Sunrise Medical or an authorised Sunrise Medical dealer.
- Before using for the first time, the battery should be fully charged.

NOTE:

- Wherever torque settings are specified, it is strongly recommended that a torque meter (not included), is used to verify correct torque specification is achieved. If no other information is given, the generic torque for M6 screws is 7 Nm.

CAUTION:

- Some of the screws that are used in manufacture have a thread lock (blue dot on the threads) and can be used up to three times, then they must be replaced by new screws with thread lock. Alternatively, you can put Loctite™ 243. Apply threadlock to the screws and re-fit them.

Storage:

The pulling device should always be stored in an environment with low humidity, on an easy to clean surface at ambient room temperature (+15°C to + 25°C).

Transport:

Your pulling device has not been designed for transportation in a vehicle.

WARNING!

- DO NOT sit on the pulling device during transportation in a vehicle.
- Always use a properly secured vehicle seat.
- The product and all its components must be secured during transport so that they are not damaged (e.g. by falling over) and do not become any risk to other people.

CAUTION!

- When loading make sure that the cables are not caught up, become kinked or otherwise damaged.
- The pulling device may not be used with damaged cables.

Safety:

- To protect your pulling device against theft and also against unauthorized use, please use a suitable lock, such as those designed for bicycles.
- For extra security on the pulling device, please switch off and remove the battery.

4.0 Fitting to the wheelchair for the first time

4.1. Fitting the clamps to the wheelchair

The pulling device must only be fitted to wheelchairs for which there is a reciprocal combination declaration between Sunrise Medical and the manufacturer of the wheelchair.

The delivery includes the appropriate clamps for your wheelchair. If you have ordered the clamps for frames with round tubes, then reducers for frame diameters of 19 mm, 23 mm, 25 mm or 28.6 mm are included. These must be inserted into the clamps prior to assembly, depending on the frame tube diameter (the shoulder of the reducer should be flush with the clamp and be facing upwards).

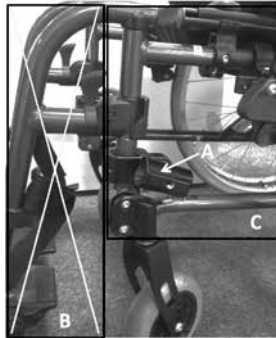
Position the clamps (A) on both sides of the wheelchair and frame. When fitting them, select a straight part of the frame tube which is not curved or angled. Position the clamps in such a way that they are parallel to one another, and are at the same height on the frame. Tighten the Allen screws (B) on the front and rear of the clamps several times on one side, then the other.

Then tighten the Allen screws with a torque of 7 Nm.



NOTE:

For wheelchairs with swingaway and removable footrest, the clamp (A) must be fitted on the main frame of the wheelchair (area C) and under no circumstances are they to be fitted on the removable footrests. (area B).



⚠ DANGER!

- If the clamps are fitted on removable footrests this will lead to damage to the wheelchair and can lead to a fall and injury to the user.

⚠ CAUTION

- Make sure that the Allen screws on the front and rear of the clamp are evenly tightened.
- Always observe the correct torque of 7 Nm.
- Check the torque of the clamps at regular intervals.

NOTE:

- Wherever torque settings are specified, it is strongly recommended that a torque-wrench (not included), is used to verify correct torque specification is achieved. If no other information is given, the generic torque for M6 screws is 7 Nm.

⚠ CAUTION:

- Some of the screws that are used in manufacture have a thread lock (blue dot on the threads) and can be used up to three times, then they must be replaced by new screws with thread lock. Alternatively, you can put Loctite™ 243 threadlock on the screws and re-fit them.

4.2. Fitting the pulling device and adjusting the fitting angle correctly

Adjust the intermediate sub-frame of the pulling device to the appropriate width



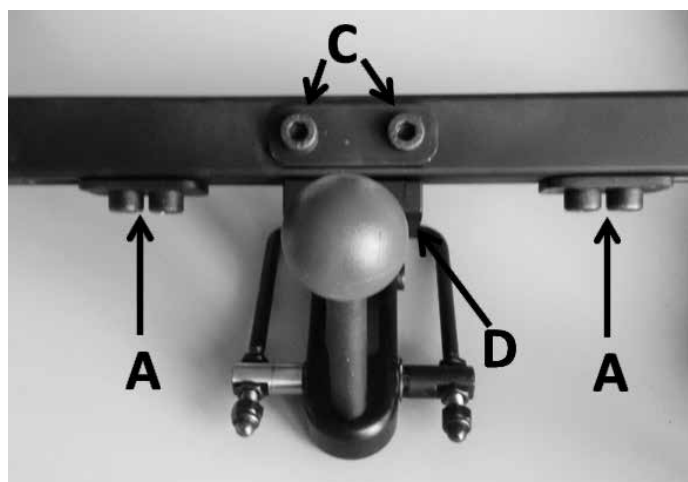
As part of the delivery of the pulling device there are 4 intermediate sub-frame cross bars (one of them is already fitted), which each cover one width range. Measure the width (D) between the clamps mounted on the wheelchair

(centre to centre) and intermediate sub-frame and then select the intermediate sub-frame cross bar which covers this range:

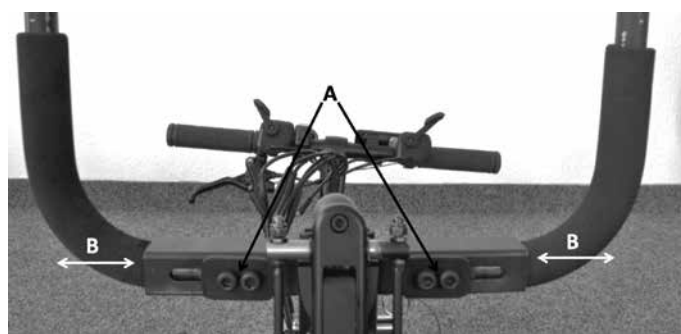
Measured width	Cross bar
350-420 mm	30-34
410-480 mm	36-40
470-540 mm	42-46
530-600 mm	48-52

If the relevant cross bar is already fitted, you can skip over the following steps and go straight to fine adjustment

- Remove the intermediate sub-frame cross bar, by separating the intermediate sub-frame from the pulling device using the quick-release bolts (see also "Transport: folding down or removing the frame").
- Now undo and remove the 2 Allen screws (C) on the rear of the cross bar and separate it from the docking mechanism (D).
- Now fit the appropriate cross bar onto the docking mechanism (D). Tighten both Allen screws with a torque of 20 Nm.
- Insert the curved tubes (B) into the cross bar, tighten the 4 Allen screws (A) just slightly for the time being.



For fine adjustment, undo the 4 Allen screws (A) on the underside of the intermediate sub-frame cross bar and telescope the intermediate sub-frame (B) to the required width. Align both sides of the intermediate sub-frame evenly, so that the docking mechanism is sitting exactly in the middle.

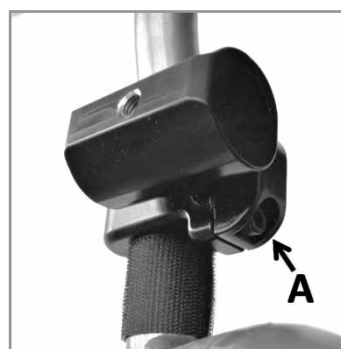


Insert the ends of the tubes of the intermediate sub-frame into the clamps fitted to the wheelchair in order to check the correct width, and now tighten the Allen screws on the underside of the intermediate sub-frame with a torque of 20 Nm. It must now be possible to insert the intermediate sub-frame into the clamps without it jamming or tilting.

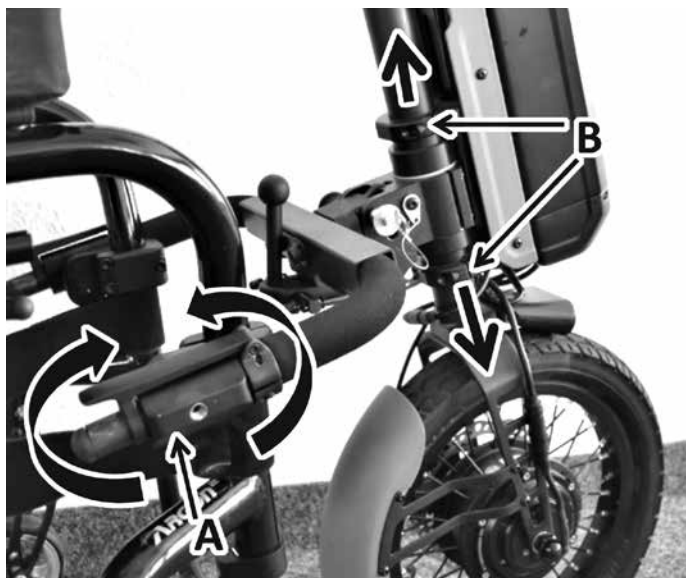
Adjusting to the right position and the best angle of the pulling device

Position the castors of the wheelchair on a 45 mm high base (or on the cardboard supports which were included with the delivery). This is the gap which should exist between the castors and the floor when driving.

Now undo the clamp screws of the angle adjustment mechanism (A) on the clamps fitted to the wheelchair so that the angle of the tube receivers can be adjusted by hand.



Undo the clamp screws of the height adjustment mechanism on the pulling device (B), so that the receiver for the intermediate sub-frame can be pushed up and down onto the frame tube of the pulling device by hand. During height adjustment the angle adjustment of the clamps on the wheelchair also changes. During this adjustment the castors remain on the 45 mm high support, screw A on the gripper clamp is still open.



Now measure the angle from the pulling device to the floor. To do this, position the stem (see also Adjusting the handlebar position) at an angle of 20° (FF variants) or 65° (SA variants) using the scale on the stem (C). Put a spirit level (D) on the top of the stem.

The aim of the adjustment is that the spirit level is level and at the same time, the castors are on a 45 mm high support, this means that the angle of the pulling device to the floor is at its best.

Having the optimum angle will ensure the best level of traction and manoeuvrability.



Once the correct height is achieved, tighten the Allen screws (B) of the angle and height adjustment with a torque of 10 Nm. Now tighten the clamp screws of the angle adjustment mechanism (A) on the clamps fitted to the wheelchair to a torque of 15 Nm.

Re-tighten screw after 30min before using the F55, then retighten again after 24hrs.



NOTE:

Wherever torque settings are specified, it is strongly recommended that a torque meter (not included), is used to verify correct torque specification is achieved. If no other information is given, the generic torque for M6 screws is 7 Nm.

⚠ CAUTION:

Some of the screws that are used in manufacture have a thread lock (blue dot on the threads) and can be used up to three times, then they must be replaced by new screws with thread lock. Alternatively, you can put Loctite™ 243 threadlock on the screws and re-fit them.

**NOTE:**

When adjusting the height, the position of the battery which is firmly attached to the steering head will also change. In order to achieve the best position for the battery in terms of the centre of gravity, the height of the battery bracket can be adjusted, by undoing the 4 Allen screws (A) of the battery mounting plate once the battery had been removed. The battery mounting plate can now be pushed up and

down. The optimum position is a gap of approx. 50 mm between the lights and the floor plate of the battery. Once the required position is reached, the 4 Allen screws (A) are re-tightened to 6 Nm.

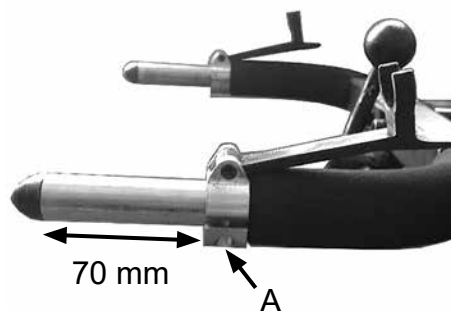
NOTE:

By adjusting the angle more accurately, the pulling device will be more compact and agile. Through optimised weight distribution the traction of the drive wheel is also improved.

⚠ DANGER!

- In any case, make sure that the gap between the feet of the user and the drive wheel is sufficiently large, even at full steering lock.
- Under no circumstances must the drive wheel touch the user's feet during driving, this may cause injury.

Fitting the safety clips to the intermediate sub-frame: the clamps with the safety clips must be fitted at a gap of 70 mm from the end of the tube. If required, push the foam rubber padding onto the intermediate sub-frame prior to assembly and shorten it accordingly. Tighten the screw of the clamps with a torque of 6 Nm.

**⚠ CAUTION!**

Always observe the correct torque.

⚠ DANGER!

The tubes of the intermediate sub-frame must, in any case, be pushed completely into the clamps and must be at least 15 mm longer than the clamps. Between the ends of the tubes of the intermediate sub-frame and the drive wheels a gap of at least 20 mm must be maintained. If this is not the case with a correct mounting position, the tubes of the intermediate sub-frame must be shortened with the aid of a pipe cutter, so that this gap can be maintained.

Changing the coloured attachments

As part of the delivery, a total of 4 colour kits are included, these consist of a mudguard and side bars in black, orange, red and blue.

The side bars can be changed easily by removing the 3 Allen screws and swapping the side bars with the colour you want.

To replace the mudguard, you must remove both Allen screws as well as the retaining plate on the inside. Reassemble by following the instructions in reverse order.

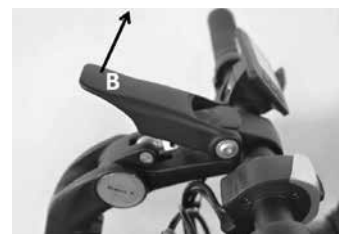
Adjusting the handlebar position

The position of the handlebar can be adjusted in several ways:



a) Height of the handle bar: the height of the handlebar can be adjusted by undoing the quick-release bracket on the frame. The handlebar together with the steering tube can now be moved up and down. After the adjustment, the quick-release bracket must be closed.

b) Position of the handlebar: the angle of the stem can be changed. To do this, push the grey slider (A) against the direction of travel until the control lever (B) can be flipped up. You can now move the stem to the angle you require (infinitely adjustable). Once the adjustment is complete, the control lever must be closed completely until you hear the slider (A) click into place.



⚠ DANGER!

- Make sure that the quick-release bracket is fully closed and the handlebar cannot be rotated.
- Make sure that the control lever on the stem is firmly clamped and that the slider is clicked into place.
- Make sure to route and secure all cables properly. Make sure not to bend or stretch cables. If necessary, use zip-ties to fasten cables.

Adjusting the steering damper

In order to stabilise the steering and directional stability of the pulling device at higher speeds, the Empulse F55 has an integrated steering damper.

The damping effect can be infinitely adjusted using the clamp screws on the steering head.



- Keep rotating the handlebar to the left stop
- Tighten both Allen screws (C) evenly (stronger damping) or loosen (less damping)
- At the factory, a torque of 2 Nm will be used

⚠ DANGER!

- If the torque of the screws (C) on the steering head is too high, this can affect how easy it is to steer the pulling device.
- If the torque is too low, the steering may be unstable at higher speeds.

5.0. Docking and de-docking of the pulling device by the user

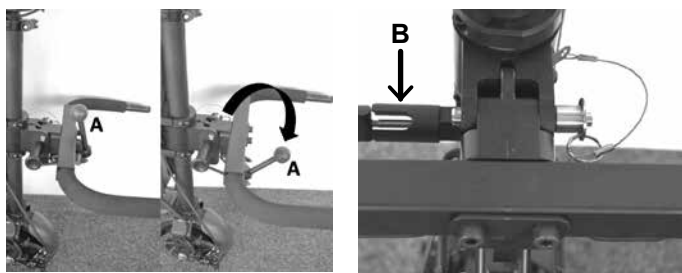
The pulling device has a feature which allows the angle of the pulling device to the wheelchair to be adjusted in order facilitate easy docking and de-docking.

⚠ DANGER!

- Always make sure that the device is switched off before docking and de-docking.
- Ensure the wheelchair is fully connected with the pulling device before use.
- As with all moving parts, there is a risk that fingers and / or clothing could become trapped. Be extra careful when operating the clamp-lever and the locking-bolt.

5.1. Docking

Undo the clamp lever (A), tighten the locking bolt (B) to the left and lock it in the open position by rotating it 90°.



The connection between the pulling device and intermediate sub-frame is now open - the intermediate sub-frame can be moved upwards.

1. Drive the wheelchair towards the pulling device and get as close as possible.
2. Switch the pulling device off using the switch on the battery.
3. Apply the wheelchair brakes.
4. Fig. 1: Lift the pulling device from the floor and insert the ends of the tubes of the intermediate sub-frame into the clamps on the wheelchair, until the required gap between the footrest of the wheelchair and the pulling device is achieved. If, in this position, the handlebar is on your thighs, you can change the height and position of the handlebar for docking and de-docking as required (See Chapter "Adjusting the handlebar position").
5. Fig. 2a: Now rotate the tommy screws of the clamps in a clockwise direction until they are hand tight and the intermediate sub-frame is securely held in the clamp.
6. Fig. 2b: Now close the additional safety clips.
7. Fig. 3: Undo the catch of the locking bolt by rotating it approx. 90° again.
8. Fig. 4: Push the handlebar forwards/upwards until the locking bolt automatically clicks into place.
9. Fig. 5: Close the clamp lever by pulling it upwards beyond the dead centre point. The ball-shaped cap of the clamp lever must be pointing upwards.
10. Only release the wheelchair brakes just before setting off.



DANGER!

- Before setting off, ensure that the pulling device is correctly docked and that all locks are closed.
- If the locks cannot be closed properly, or you have the feeling that they are not properly closed, please contact your dealer for this to be checked. Under no circumstances should you set off, there is a risk of accident and injury.
- The gap between castors of the wheelchair and the floor must be at least 30 mm - otherwise there is a risk of accident and injury.
- The docking and de-docking procedures should always take place on an even surface.
- With all moving parts, pay attention to your fingers - there is a risk of finger entrapment.

NOTE:

- Before setting off, take a moment and go through the following checklist
 - Both tubes of the intermediate sub-frame are complete and are pushed into the clamps to the same point on both sides. The ends of the tubes are at least 15 mm longer than the clamps and end at least 20 mm away from the drive wheel.
 - The tommy screws are tightly closed on both sides and also clamp the intermediate sub-frame securely.
 - The safety clips are closed on both sides and also hold the intermediate sub-frame in place.
 - The locking bolt is locked in place and locks the intermediate sub-frame in the drive position.
 - The clamp lever is completely closed (ball points upwards) and there is no play.
 - The gap between the castors of the wheelchair and the floor is at least 30 mm.

5.2. De-Docking

To de-dock, proceed as follows:

1. Apply the wheelchair brakes.
2. Switch the pulling device off using the switch on the battery.
3. Undo the clamp lever.
4. Push the handlebar gently forwards/upwards.
5. Pull the locking bolt to the left out of its lock position and rotate it 90° until it clicks into place in this position.
6. Now lower the pulling device slowly until the castors of the wheelchair touch the floor.
7. Open the safety clips by flipping them forwards.
8. Undo the tommy screws of the clamps on both sides and pull the pulling device forwards until the tubes of the intermediate sub-frame have been pulled completely out of the clamps.
9. Now place the pulling device carefully onto the floor, or position it on the stand (option).

DANGER!

- Make sure that you support the pulling device before you pull the locking bolt out of its lock position - there is a risk of injury if the pulling device lowers in an uncontrolled manner.
- With all moving parts, pay attention to your fingers - there is a risk of finger entrapment.
- The docking and de-docking procedures should always take place on an even surface.
- Place the pulling device carefully onto the floor so that it does not get damaged.

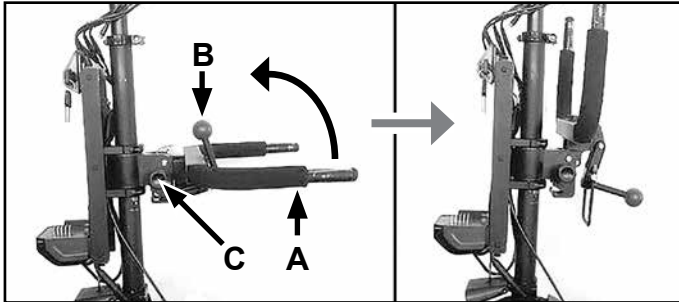
NOTE:

- If you close the clamp lever before placing the pulling device down, the pulling device will be secure and stable on the end caps of the intermediate sub-frame.

5.3. Transport: Folding down or removing the intermediate sub-frame

For transportation, the Intermediate sub-frame can be folded down to save space.

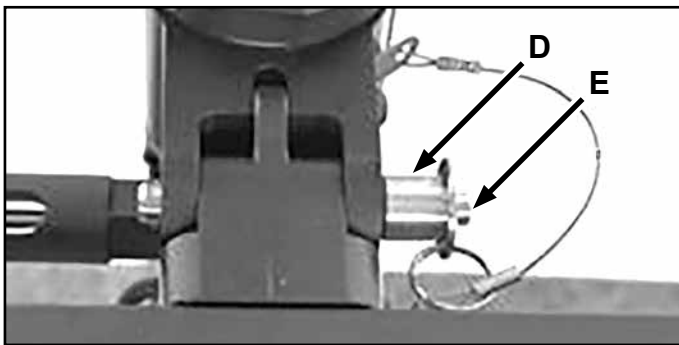
1. Undo the clamp lever (B) and detach the metal bracket connected to the clamp lever from the steering head.
2. Pull the locking bolt to the left out of its lock position and rotate it 90°.
3. Fold the intermediate sub-frame (A) upwards.
4. Undo the catch of the locking bolt (C) by rotating it approx. 90° again so that it can lock into place and fix the intermediate sub-frame in the folded position.



When unfolding the intermediate sub-frame make sure that the metal lever of the clamping bracket is correctly mounted on the steering head afterwards.

In order to remove the intermediate sub-frame completely, you can remove the quick-release bolts (D), by holding the button (E) pressed down and pulling the quick-release bolts to the right out of the steering head. After you have pulled the locking bolt out of its catch, you can remove the intermediate sub-frame.

Fit by following the instructions in reverse order.



⚠ DANGER!

- When refitting the intermediate sub-frame, make sure that the quick-release bolts are locked properly
- When unfolding the intermediate sub-frame make sure that the metal lever of the clamping bracket is correctly mounted on the steering head afterwards.

6.0 Operation

Word	Definition
⚠ DANGER!	Advice to the user of Potential Risk of serious injury or death if the advice is not followed
⚠ WARNING!	Advice to the user of a risk of injury if the advice is not followed
⚠ CAUTION!	Advice to user that potential damage to equipment may occur if the advice is not followed
NOTE:	General advice or best practice

6.1. Brakes

The pulling device has two brakes:

- a mechanical disk brake which is operated by a brake lever on the handlebar (A) (left)
- an electrical brake, which is operated using the operating paddle on the handlebar (B) (left). The electrical brake only works when the pulling device is switched on and ready for use.



Before driving, familiarise yourself with the operation, response and braking force of both brakes

⚠ DANGER!

- The electrical brake only works when the pulling device is switched on and ready for use.
- You will only achieve the maximum brake performance with the mechanical disk brake.
- Hard and sudden application of the brakes may cause you to fall forward with your upper body, resulting in possible injury. Therefore always stabilise yourself by holding onto the handles firmly with both hands.
- Braking power can be severely decrease by any or all of the following:
 - Worn tyre tread
 - Tyre pressure which is too low or too high
 - Soiled and wet tyres
 - Worn brake pads
- Ensure that the brake pads and brake discs do not become contaminated with oil and/or grease. If this happens the brake pads must be replaced. The brake disc must be professionally degreased with a brake cleaner.
- The disk brake is not self-adjusting and needs to be re-adjusted when the brake pads wear. Please contact your dealer to carry out this work.
- Be aware that the condition of the ground surface can significantly affect braking efficiency.
- Be aware that the stopping distance is extended when braking on a slope.
- The braking effect will be greatly reduced if the surface is wet, dirty, sandy, stony, uneven or otherwise compromised by environmental conditions. It is best to avoid these conditions. If this is not possible adapt your driving style to avoid the risk of potentially serious accidents.
- Always check the efficiency of the brakes before starting your journey to ensure that they are working correctly. The brakes should be checked regularly by your dealer and adjusted if required.
- If you stop on a steep slope (upwards), it can happen that the brake of the pulling device cannot hold the combined unit because of a lack of traction on the front wheel.

6.2. Switching on and off

Your pulling device has two switches:

- An On/Off switch on the battery housing - always switch this on first (to do this, see "Switching the battery on and off").
- An On/Off switch on the display: by pressing the middle "On/Off" button (for 2 seconds) you can switch the pulling device on or off.
- You can switch the lights on by holding the "+" button on the display pressed for 2 seconds. To switch off, press the "+" button again for 2 seconds. The display backlight is also switched on and off with the lights.

⚠ WARNING!

- Always switch the pulling device off before docking or de-docking in order to avoid unintentional operation
- When not being used, always switch the pulling device off using the switch on the battery.

6.3. Selecting the direction of travel

- The direction control switch on the handlebar allows you to select the direction of travel. When the switch is pushed forwards in the direction of travel, the pulling device moves forwards when the throttle is activated.

- In order to change the direction of travel, the pulling device must be brought to a standstill. Then the direction control switch must be moved to the backwards position (travel direction to the back). Activating the throttle will move the pulling device backwards.

⚠ DANGER!

- The direction of travel can only be changed when the device is stationary. Operating the direction control switch when driving only has an effect once the device has come to a standstill.
- Before setting off each time, check the position of the direction control switch in order to avoid unintentionally moving backwards (risk of injury).
- When driving backwards take note of your environment in order to avoid collisions.
- Please note that the steering behaves differently when going backwards compared with going forwards. Abrupt steering movements can lead to a fall (risk of injury).

6.4. Controlling the speed (throttle)

- Using the throttle (A) you can control the speed with the thumb of your right hand.
- By applying greater pressure, the speed increases, by reducing the pressure, the speed will drop.
- When you let go of the throttle, the speed will drop, the pulling device will roll to a standstill.

**⚠ DANGER!**

- Always adapt your speed to your environment in order to avoid collisions (risk of injury).
- Familiarise yourself with the way your combined unit handles cornering before you drive at higher speeds (risk of injury).
- Before activating the throttle always check that the direction control switch is set to the required direction of travel.
- Always switch the pulling device off when docking and de-docking as well as when it is not being used in order to prevent accidental activation of the throttle.

NOTE:

- Driving at full throttle for long periods of time can mean that the motor is subject to extreme thermal load. In order to avoid overheating, the power will be restricted until the motor reaches a normal operating temperature again.

6.5. Selecting the drive levels

- Different drive levels (1, 2, 3) can be selected using the display, these determine the max. achievable speed in that particular Drive level.
- The drive levels can be selected using the “+” and “-” buttons on the display. The selected drive level will be shown in the top right of the display.

NOTE:

- The max. speed and max. motor performance will only be achieved in drive level 3.

6.6. Cruise control



- By using the yellow pushbutton (A) which is integrated into the housing of the direction control switch, the current speed of the pulling device can be maintained (cruise control) without having to hold the throttle.
- Accelerate the pulling device to the required speed and then press the yellow pushbutton. The pulling device will now hold that speed, even if you let go of the throttle.

- By pressing the pushbutton again or activating the brake (both mechanical and also the electrical brake), the cruise control will be deactivated immediately.
- When the cruise control is activated, it is not possible to accelerate using the throttle, to do this you will need to deactivate the cruise control.

! DANGER!

- The cruise control can only maintain the set speed in terms of available motor power. If you are going up a slope with the cruise control activated, the speed may go down.
- When going downhill with the cruise control activated, it will attempt to maintain the set speed with the aid of the electrical motor brake. At the point when the slope is too steep and the electrical brake is no longer sufficient, the speed will increase. If necessary, you will need to activate the mechanical brake in order to maintain the required speed.

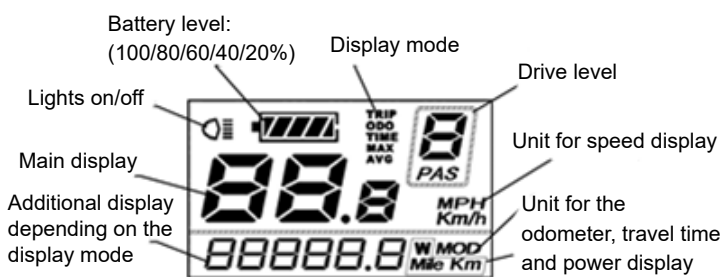
! DANGER!

- Familiarise yourself with how the cruise control works before you use it. Practice activation/deactivation at low speeds.
- Even with the cruise control activated, you need to be constantly attentive and be ready to brake.
- Pay particular attention to your speed when going downhill with the cruise control activated. Control the speed manually if necessary using the mechanical brake (risk of injury).

NOTE:

- If you do not use your pulling device for long periods of time, we recommend that you switch your pulling device on every 4 weeks and allow the wheel to rotate for approx. 5 minutes at low speed in order to guarantee that the grease that is there is distributed over all bearing positions, this will prevent corrosion of the bearings.

6.7. Functions of the display



- Selection of the drive level; Lights on/off
- Switching on and off; Display mode selection
- Selection of the drive level

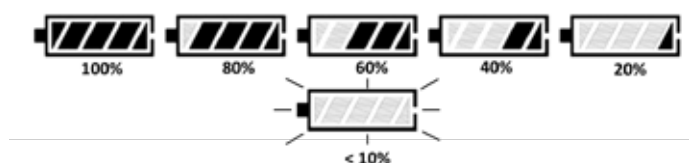
- After the pulling device is switched on by pressing the “On/Off” button for 2 seconds (also see “Switching on and off”) the display shows the current speed in the main screen and the total kilometres in the additional display. In addition, the selected drive level (after switching on, drive level 1 is pre-selected) as well as the current battery capacity is displayed.

6.7.1 Lights:

The lights can be switched on or off by pressing the “+” button for 2 seconds. This is displayed by the relevant symbol on the display (upper left corner).

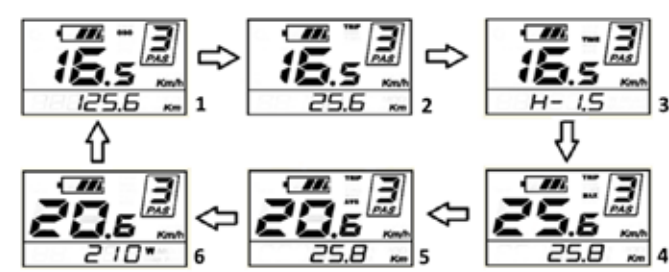
6.7.2 Battery capacity:

This is displayed in 20% steps. As soon as the battery display starts to flash, the battery must be charged immediately.



6.7.3 Display mode:

By pressing the “On/Off” button you can now select different display modes:



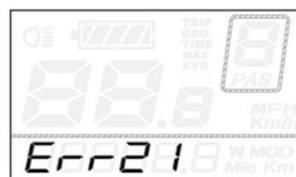
1. Display mode: “ODO” - Main display: Speed	Additional display: Total km
2. Display mode: “TRIP” - Main display: Speed	Additional display: Daily km
3. Display mode: “TIME” - Speed	Additional display: Travel time
4. Display mode: “TRIP MAX” - Main display: max. speed driven	Additional display: Daily km
5. Display mode: “TRIP AVG” – Main display: average Speed	Additional display: Daily km
6. Display mode: “Instantaneous power”- Main display: Speed	Additional display: Power in Watt

⚠ DANGER!

- Only carry out setting work when the device is stationary and never when driving.

6.7.4 fault code display:

when the electronics detect faults in the system, these are displayed in the form of fault codes on the display.



The fault code always starts with the letters “Err” and ends with a two-digit number:

Fault code	Definition
21	Current Abnormality
22	Throttle Abnormality
23	Motor Abnormality
24	Motor Hall Signal Abnormality
25	Brake Abnormality
26	Low Voltage
30	Communication Abnormality

Faults can arise once sporadically. Each time the device is restarted, the fault code is deleted. If the fault should arise again, we recommend that you make a note of the fault code and contact your dealer.

6.7.5 Settings:

You can open the settings menu in order to carry out basic settings.

NOTE:

- These settings can only be carried out when stationary.

1. Deleting the odometer:

press the “+” and “-” buttons at the same time and keep them pressed for 2 seconds. The “tC” menu opens.



The display shows “tC-n”, pressing the “+” button you can toggle between “tC-n” (do not zero daily kilometres) and “tC-y” (zero daily kilometres). Select “tC-y” to zero the odometer and press the

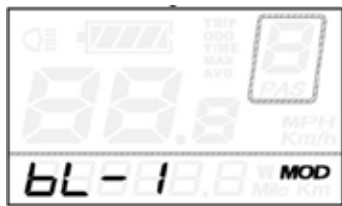
“On/Off” button for 2 seconds in order to confirm the entry and leave the menu.

or

Press the “On/Off” button briefly to confirm and toggle to the next menu point.

2. Adjusting the brightness of the display backlighting:

“bL” (“backlight”) will now be shown in the display and the display backlight will be switched on.



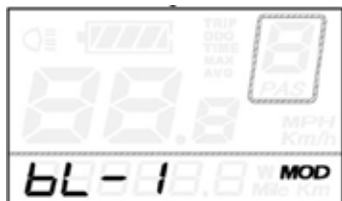
In order to adjust the brightness, you can select between three brightness levels (bL-1/ bL-2/ bL-3) using the “+” and “-” buttons. Press the “On/Off” button for 2 seconds to confirm the entry and leave the menu.

or

Press the “On/Off” button briefly to confirm and toggle to the next menu point.

3. Changing the units:

“bL” (“backlight”) will now be shown in the display and the display backlight will be switched on.



Using the “+” and “-” buttons you can toggle between “U-1” (miles/mph) and “U-2” (kilometre/kph). Press the “On/Off” button for 2 seconds in order to confirm the entry and leave the menu.




7.0 Battery and charger

7.1 Introduction

The battery delivered with the product must only be used to drive the Empulse F55 from Sunrise Medical. No other components may be connected to it. Any other use requires the written authorisation of the manufacturer. This operating manual only describes the use of the above-mentioned battery and corresponds to the state of the art at the time of print.

The manufacturer reserves the right to make changes resulting from further development of the mechanics, software or legal requirements. The manufacturer regards uses including the following as misuse of the battery:

- Use of the battery that contravenes the instructions and recommendations in this operating manual.
- Exceeding the technical limits laid down in this operating manual.
- Technical modifications to the battery.
- Changes to the software of the battery.
- Unauthorised attachments or use of the battery.
- The manufacturer shall not be liable for any damage caused by improper use of the battery.

Word	Definition
 DANGER!	Advice to the user of Potential Risk of serious injury or death if the advice is not followed
 WARNING!	Advice to the user of a risk of injury if the advice is not followed
 CAUTION!	Advice to user that potential damage to equipment may occur if the advice is not followed
NOTE:	General advice or best practice

7.2 Safety instructions for the battery and charger

WARNING!

Read and observe the following safety instructions and precautions before activating the battery and before starting the charging process.

DANGER!

- Failure to comply with the safety precautions and instructions may damage the product or result in electric shock, fire and/or serious injuries.
- The lithium-ion battery contains chemical substances, which may cause hazardous reactions if the safety instructions specified here are disregarded.

CAUTION!

The manufacturer accepts no liability for damage resulting from non-compliance with these instructions.

Safety instructions and precautions on the use of the battery:

WARNING!

- Before using for the first time, the battery should be fully charged.
- The battery must only be used at temperatures between -20 °C and 60 °C.
- The battery must not be exposed to heat (e.g. radiators) or fire. External heat exposure can lead to the battery exploding.
- In the (unlikely) event of the battery overheating or catching on fire, you must ensure that the battery does not come into contact with water or other liquids. The only suitable extinguishing agent that is recommended by the cell manufacturers is sand.
- If possible, charge the battery after every use.
- For use for any other purpose than the one intended by Sunrise Medical, you will require the written authorisation of the manufacturer.
- The battery must not be opened or taken apart. Improper opening or wilful destruction of the battery involves the danger of serious injury. In addition, opening the battery voids any warranty claim.
- Never connect the battery contacts in the charging socket to metallic objects, or ensure that the contacts never come into contact with metallic objects (for example with metal filings).
- If the charging socket is dirty, clean it with a clean and dry cloth.
- Never immerse the battery in water.
- The useful life of the battery depends, among other things, on its storage location. Consequently, never leave the battery in hot locations for prolonged periods. In particular, use the boot of a car parked in the sun only for transport rather than as a storage location.

- The battery must not be subjected to mechanical impact. However, if this should happen, the battery must be checked by the manufacturer. Contact your servicing agent. You must not continue to use a damaged battery.
- If damaged or defective, the battery must be singled out and checked. Please contact your specialist dealer and discuss with them the next steps with regard to return and repair. The defective/damaged battery must not be used again or opened.
- Always ensure that the battery is kept clean and dry.
- Charge battery on a fire-and-heat-resistant underground. Do not place easily flammable or flammable objects close to the battery.
- Mishandling can lead to overheating, fire or explosions.

Safety instructions and precautions on how to store the battery:

WARNING!

- Protect the battery immediately upon separating from the battery charger or motor. Never allow any moisture or foreign particles (e.g. metal fragments, small nails, filings or other conductive metals) to get into the battery.
- Do not expose the battery to moisture of any kind during storage (water, rainwater, snow, etc.).
- Before storing it, charge the battery and check its charge status every 3 months.
- Store the battery in a cool and dry location where it is safe from damage and unauthorised access.
- To achieve the optimum battery service life, it should be stored at a temperature from 10°C to 25°C and at a humidity of 20% to 75%.
- Battery storing conditions can be found in technical specification section.
- Avoid direct sunlight.
- When the battery is not in use, recharge it at least every 12 weeks to prevent damage.

Safety instructions and precautions on the charging process:

WARNING!

- Only charge the battery in a ventilated, dry and dust-free environment.
- Do not charge the battery in the presence or vicinity of flammable liquids or gases.
- Do not expose the battery to moisture of any kind during charging (water, rainwater, snow, etc.).
- Do not carry out the charging process in rooms where moisture may affect the battery.
- The battery must only be charged at temperatures between 0 °C and 40 °C. If you attempt to carry out a charging process outside of this temperature range, the battery mechanism automatically switches off the charging process.
- Only use the designated charger to charge the battery. Your specialist dealer can provide the relevant information.

⚠ DANGER!

- Using an unsuitable battery charger can lead to malfunction and result in the battery having a limited service life. There is also a danger of fire and explosion.
- When the charging process is complete, disconnect the charger from the mains socket first before disconnecting it from the battery.
- Ensure adequate air circulation as soon as the battery is charged. In principle, only charge the battery under supervision.
- Damaged batteries must not be recharged or used any further.
- Damaged battery chargers (damage to the plug, housing, cable) must not be used.

Safety information and precautions on how to transport and ship the battery:**⚠ WARNING!**

- Lithium-ion cells are used in the battery. Transport and shipping of the battery are, therefore, subject to all applicable statutory requirements, which must be strictly observed. For instance, a defective battery must never be transported by plane.
- If your battery is defective, take it personally to your specialist dealer as shipping lithium-ion batteries by post or other carriers is subject to strict rules and regulations. Once again, we recommend that you contact your specialist dealer.
- As transport regulations may change annually, we strongly recommend that you consult your travel operator, airline or shipping line before you set out on your trip in order to learn about the current applicable regulations. A defective battery must not be taken on a plane or put in your luggage.

NOTE:

- If your battery is fitted to the pulling device when being transported, relaxed transport regulations apply in accordance with UN3171.
- Make sure you keep the packaging container of the battery in case you need to transport it.
- Discuss transportation with your specialist dealer prior to shipping.

Safety information and precautions on the charger:**⚠ WARNING!**

- Before starting the charging process, read and follow all instructions and precautions enclosed with the charger and the following precautions and safety information.
- Only use the designated charger to charge the battery. Your specialist dealer can provide the relevant information.
- When the charging process is complete, we recommend disconnecting the charger from the mains socket first before disconnecting it from the battery.
- Do not expose the charger to moisture of any kind during charging (water, rain water, snow, etc.).
- Do not carry out the charging process in rooms where moisture may affect the charger.
- Be aware of condensation. If the charger is brought from a cold room into a warm room, condensation may form. In this case, refrain from using the charger until all condensation has dissipated. Please note that this may take several hours.
- Never carry the charger by its power cable or the charger cable.
- Never tug at the power cable to disconnect the charger from the mains socket.
- Never subject cable and plug to any pressure. Overstretching or bending the cable, pinching a cable between a wall and a window frame or placing heavy objects on a cable or a plug may result in electric shock or fire.
- Lay the power cable and the attached charging cable so that nobody can step on it or trip over it and so both cables are protected against any other harmful effects or stress.
- Do not operate the charger if the power cable, the charging cable or the plugs attached to the cables are damaged. Damaged parts must be replaced immediately by the authorised specialist dealer.
- Do not use or disassemble the charger when it has received a hard blow or was dropped or damaged in another way.
- The charger must not be used by children.
- Never attempt to disassemble or modify the charger.
- Do not cover the charger during the charging process or place any objects on top of the device.
- Never connect the terminals of the charging plug with any metal objects.
- Ensure that the plug is firmly inserted in the socket.
- Never touch plugs with wet hands.
- Do not use the plug of the charger and/or the mains plug if they are wet or dirty. Before inserting it, clean the plug using a dry cloth.

7.3. Notes for transportation in aeroplanes

Shipping lithium-ion batteries or taking them with you on aeroplanes is strictly regulated. The guidelines may vary depending on the airline. In all cases, contact your airline or carrier, before you transport or want to send a device on an aeroplane which operates on lithium-ion batteries.

⚠ WARNING!

- The battery of the Empulse F55 contains lithium-ion cells. For shipping or transportation, you must comply with the relevant legal guidelines.
- The guidelines for shipping lithium-ion batteries or transportation in an aeroplane may change. It is essential that you contact your airline or travel operator in order to obtain information about the current guidelines before you start a trip or plan shipping.
- Defective batteries cannot be transported in an aeroplane under any circumstances.
- If your battery is defective, please contact your dealer to find out how to proceed. In this case, special conditions apply for transporting hazardous products.
- In all cases switch the battery off for transportation and protect the contacts on the underside of the battery against short circuiting.

7.4. Switching the battery on and off

The battery has an on/off switch on its housing (A). The current will only flow when the battery is switched on. The pulling device can only be switched on if the battery is switched on.

To switch on, proceed as follows:

- Press the push button on the housing of the battery. The push button clicks into the place, slightly below the level of the housing.
- To switch off, you need to press the push button again.



NOTE:

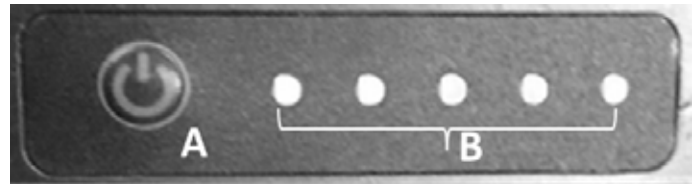
- Always switch the battery off when the pulling device is not being used. In this way, you can guarantee that no current will flow and the risk of self discharge of the battery is as small as possible.

⚠ WARNING!

- Always switch the battery off before you remove the pulling device.

7.5. Charge status display for the battery

The battery has an integrated charge status display. This is fitted on the front side of the battery. Using this display you can check the charge status of the battery quickly and easily.



- Press the button (A) next to the charge status display
- 5 green LED (B) means 100% charged, 4 LED= 80%, 3 LED= 60%, 2 LED=40%, 1 LED=20%
- The display will go back off after approx. 60 seconds.

NOTE:

- For long periods of storage the battery can go into deep sleep mode, in order to avoid self discharge. To resume operation, the button next to the charge status display must be pressed once.

7.6. Detaching the battery

- The battery can be removed for charging or as protection against theft.
- In order to prevent unauthorised removal of the battery, the battery is fixed to the battery bracket with a lock.
- The battery can be removed as follows:
 - Switch the battery off (see “Switching the battery on and off”).
 - Open the lock using the key. To do this insert the key into the lock and then rotate it 90° anti-clockwise until it reaches the stop. Keep it in this position.
 - The battery can now be tipped to the right (in the direction of travel). To do this hold the battery at the top and push it to the side.
- To fit, insert the lower part of the battery into the floor plate of the battery bracket, then push the upper part of the battery gently against the battery bracket and push to the left (in the direction of travel) until the battery clicks into the battery bracket.



NOTE:

- The pulling device is delivered with two identical keys. Always store the keys separately and make a note of the key number.

7.7. Charging the battery

Fully charge the battery before its first use. The battery capacity upon delivery is generally 30%. The battery can be charged at any capacity without adversely impacting its service life. The battery achieves its maximum service life when it is charged at an ambient temperature of between +10 °C and +30 °C.

- The battery can be removed for charging but can also be charged when fitted to the pulling device.
- To charge, connect the battery to the charger delivered with the product. Remove the rubber bungs from the charging socket of the battery, then plug the charging plug into the charging socket and tighten the cap nut.
- Now plug the mains plug of the charger into a socket
- During the charging process, the LED on the charger will be illuminated in red.
- When the battery is fully charged, the LED on the charger will change to green.
- The LEDs of the charge status display of the battery also display the current charge status of the battery.

NOTE:

- Before inserting the plug in the socket, ensure that both parts are clean and there are no metallic particles on them. If you detect such particles, use a dry and clean cloth to remove them.
- During the charging process, the pulling device cannot be used.

⚠ WARNING!

- The charging process ends automatically as soon as the battery is fully charged. This avoids overcharging.
- Do not leave the charger connected to the mains socket any longer than necessary.
- When the charging process is complete, disconnect the charger from the mains socket first before disconnecting it from the battery.
- Before using the device, always check the charge status of the battery.
- The battery should be fully charged prior to use in order to provide motorised support at all times.
- The battery may only be charged in a dry room at temperatures between 0° and 40° C.
- We recommend charging the battery fully before longer periods of storage, eg, before a winter break and re-charge regularly (approx. ever 12 weeks).

7.8 Battery warranty:

Battery warranties are subject to periods set by the manufacturers. However, most of these warranties are subject to a wear and tear clause, and if you genuinely wear out your batteries in 12 months, it will not be possible to obtain a replacement under warranty.

8.0 Maintenance and troubleshooting

The pulling device is equipped with an 8.5" or 14" drive wheel.

With 14" drive wheels, make sure that the tyres are always at the recommended tyre pressure, as this will significantly affect the driving characteristics. If the tyre pressure is too low, movement and manoeuvrability is made more difficult due to the increased rolling resistance and this also increases the amount of effort required.

The optimum tyre pressure (usually 3-4 bar) is indicated on the tyre wall.

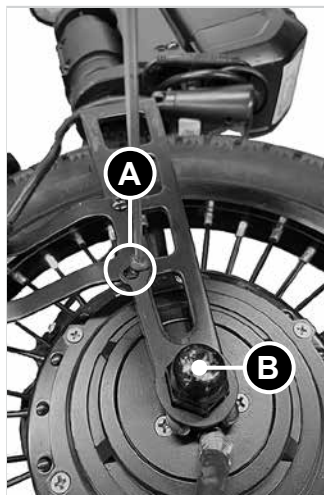
8.1. Wheel assembly and disassembly:

8.1.1 Wheel disassembly

14" and 8,5" wheel disassembly

- Switch the battery off and carefully remove it from the pulling device.
- Unplug the cable which connects the drive wheel to the pulling device at the connection. Make sure that no dirt or moisture can get into the plug and clean the contacts with a clean, dry cloth. Do not use lubricating or penetrating oil to clean the contacts.

- Loosen the Allen screws (A) on left and right side of the wheel.
- Detach the safety locks from the wheel nuts
- Remove the drive wheel, by undoing the nuts which are used to screw the drive wheel onto the fork (B) on both sides and then pull the drive wheel downwards off the fork.



8.1.3 Wheel assembly and disassembly

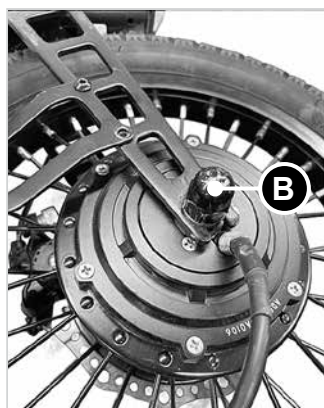
- Add the safety lock as shown on the pictures below:



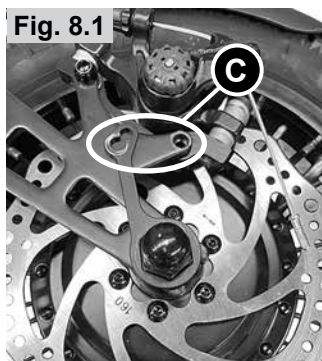
8.1.2 Wheel assembly

14" and 8,5" wheel assembly

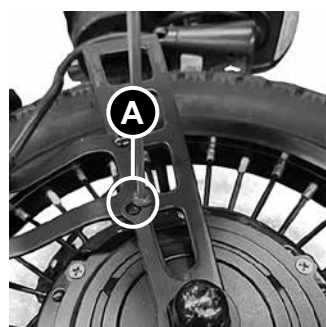
- Insert the drive wheel.
- Tightening the wheel nuts by 48 NM (B).



- Tighten the wheel nut (B) even further until the screw hole of the safety lock and the fork are aligned as shown on the example below (C) (Fig. 8.1 - 8.3).



- Tighten the Allen screws (A) to fix the safety lock.
- Connect the motor cable again.



8.2 Tyre Replacement

NOTE:

The 8.5" wheel has a solid rubber tyre. Please contact your dealer when tyres need to be changed.

- Pull the tyres off the rim using two plastic tyre levers.

Before fitting a new inner tube:

- Inspect the base of the rim and the tyre inner wall for foreign bodies and if necessary clean thoroughly
- Check the condition of the rim tape, particularly at the valve hole. Only well fitting, strong rim tape offers long-term protection against inner tube damage through burrs and sharp spoke heads.

Assemble by following the instructions (8.1) in reverse order.

⚠ DANGER!

- Make sure you use the right torque for the wheel nuts on the left and right of the fork (48 Nm).
- After fitting, check the tyre pressure again.

8.3 Regular maintenance

Your pulling device is subject to high levels of stress when being used, and requires regular checks in order to guarantee your safety.

⚠ DANGER!

Carry out the visual inspections/maintenance as described below regularly, at least every 4 weeks, and ideally before you set off each time:

- Make sure that all screws and fasteners are secure.
- Functional and safety check of all lights (if fitted).
- Functional/safety check of the docking system (pulling device and wheelchair) to make sure they are secure and check for wear.
- Check the brake pads for wear and that the brakes work properly. The disk brake must be re-adjusted/maintained regularly by a dealer.
- Check function of the disk brake (get your dealer to replace cables and brake pads if needed).
- Visual inspection of the fork and intermediate sub-frame for damage (e.g. cracks, corrosion, deformation etc.).
- Visual inspection of the wheelchair frame and back tubes for damage (e.g. cracks, deformation, etc.).
- Check tyres (tread, cracks, damages) and replace if needed.
- Check the spoke tension and the rim and hub of all wheels (wheelchair wheels as well) for damage.
- Check all cable and electrical connectors.
- Check that the steering head and handlebar are secure.

8.4 Electrical system

If fault codes arise, or the electrical system of the pulling device does not function as intended:

- Contact your dealer.
- Press the button on the charge status display in order to wake the battery from "Deep sleep mode" if necessary.
- Switch the pulling device on and push it forwards 1 m by hand – check that it is working again
- Switch the battery off and carefully remove it from the pulling device.
- Check all freely-accessible plug connections for dirt or moisture. Clean the contacts if necessary with a clean, dry cloth. Use contact spray if necessary, but do not use lubricating or penetrating oil to clean the contacts under any circumstances.

9.0 Accessories

9.1 Additional weight

Assembly

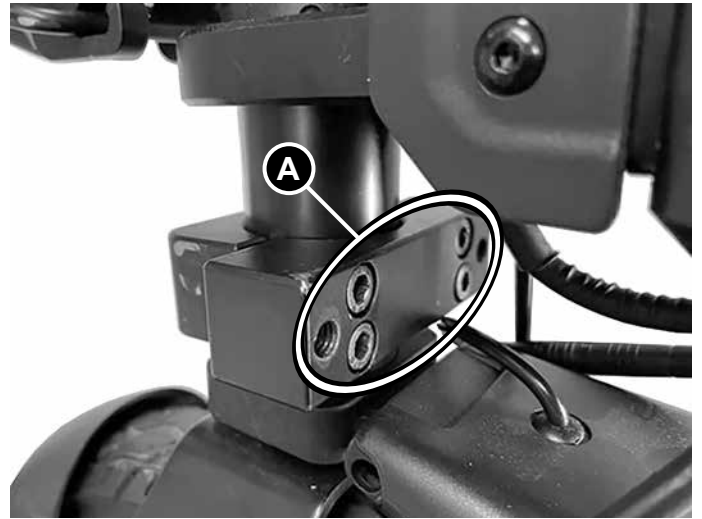
- Open the screws on the bracket completely (A).
- Position the wider part of the bracket on the front
- Tighten the 4 screws (A) slightly that the parts still moving.



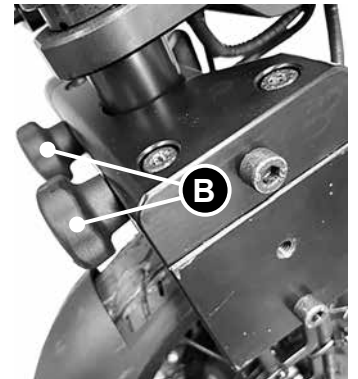
- Make sure that the distance between fork and bracket is higher than 25mm.
- Make sure that there is 50mm distance between fork and bottom side of the controller.



- Align the bracket with the fork and tighten the screws (A) crosswise by 10NM.



- Take the inner part of the additional weight and put it on the bracket
- Tightening the both hand screws on the backside with hand force (B)
- Attach left and right part of the additional weight and tighten the hand screws (C) with hand force .
- To detach the weight open the hand screws to attach put on weight and tightening the hand screws again.



⚠ WARNING:

Make sure that the additional weight is not in contact with any cables. If they are in contact please change the cable routing that there is no contact.

Retighten the Screws (B & C) before every ride

10.0 Technical Specifications

General data	
Operating Voltage	36 Volt
Range of action	up to 30 km*
Max. Speed options	6 kph; optional 10/15 kph (speed can be regulated in 3 levels)
Climbing power (nominal)	up to 11% (6°)
Flammability standards	tested according to EN 12184 and subordinated EN 1021-2
Max. Load	110 kg
Total weight	From 13 kg
Max. dimensions	1040mm x 600mm x 840mm (height x width x depth). The total dimensions of a wheelchair/ pull-device combination can exceed the dimensions of the wheelchair used by 765mm (in length) and 130mm (in width).

Motor data		
Wheel size	14"	8.5"
Rated voltage	36 Volt	36 Volt
Max. Current	15 A	15 A
Power	300 W (Nominal) 400 W (Max)	350 W (Nominal) 400 W (Max)
Input Power	14" row = 510W (Max)	8.5" row = 520W (Max)
Maximum torque	23 Nm	13 NM
Protection Rating	IP44	IP44
Motor noise	max. 65 +/-5 dbA in 1 m gap	max. 65 +/-5 dbA in 1 m gap
Warranty	2 years	2 years

Battery data	
Battery type	Lithium-ion
Rated voltage	36 Volt
Capacity	8.1 Ah
electrical power	291.6 Wh
Discharge current	20 A Max.
Charging time	4.0 - 5h (approx. at 2.0 A charging current)
Charging temperature range	10 - 45°C
Operating temperature	-25° to 50°
Storage temperature range	-40° to 65°
Maximum number of charging cycles	1000
Protection Rating	IP54
Warranty	1 year
Display	State of charge
Functions	On/off switch; lockable
Weight of battery pack:	2 kg

Battery Charger	
Input	100-240V AC
End-of-charge voltage	42 Volt
Charging current	2.0 A
Protection Rating	IPx4

Controller	
Rated voltage	36 Volt
Max. Current	15 A
Protection Rating	IP54

Display	
Displays	State of charge of battery Drive level Distance travelled Current speed in kph Current motor power in Watt
Function	Selection of drive levels 1, 2, 3
Protection Rating	IP65

Thumb throttle	
Protection Rating	IPX5

Thumb brake	
Protection Rating	IPX5

Control unit forwards/backwards, cruise control	
Protection Rating	IPX4

Mechanical brake	
Protection Rating	IP76

11.0 Notes on storage

Battery:

- Protect the battery immediately upon separating from the battery charger or motor. Never allow any moisture or foreign particles (e.g. metal fragments, small nails, filings or other conductive metals) to get into the battery.
- Avoid storage in humid areas to prevent corrosion on the plug contacts.
- Do not expose the battery to moisture of any kind during storage (water, rainwater, snow, etc.).
- Before storing it, charge the battery and check its charge status every 3 months.
- Store the battery in a cool and dry location where it is safe from damage and unauthorised access.
- To achieve the optimum battery service life, it should be stored at a temperature from 5°C to 25°C and at a humidity of 0% to 80%.
- Do not keep your battery in places where the temperature exceeds 45°C or is less than -20°C.
- Avoid direct sunlight.
- When the battery is not in use, recharge it at least every 12 weeks to prevent damage.

Pulling device:

- Store the pulling device in a dry place, protected from rain and snow.
- Cover the pulling device during long-term storage in order to protect it from dust.
- Do not store the pulling device at temperatures above 60°C or below -20°C.
- If you do not use your pulling device for long periods of time, we recommend that you switch your pulling device on every 4 weeks and allow the wheel to rotate for approx. 5 minutes at low speed in order to guarantee that the grease that is there is distributed over all bearing positions, this will prevent corrosion of the bearings.
- After a long period of storage, check that the brakes are working and check the condition of the tyres before setting off.

12.0 Cleaning and hygiene

Cleaning:

- The pulling device should be cleaned regularly and after each bigger journey with commercially available, household cleaning agents and a little water.
- If needed only use a little water.
- The display, battery and all other electronic components may only be cleaned by wiping with a damp (not wet) cloth.
- The drive wheel can be cleaned with a soft sponge or a soft brush.
- The clamps on the wheelchair and the docking system can be cleaned with water, a soft sponge or a soft brush (recommended after each ride).
- After cleaning please, a penetrating oil (e.g. Ballisto WD 40, Caramba, etc.) can be used to lubricate the moving parts of the docking mechanism.

CAUTION!

- Never use steam or high pressure to clean the device.
- Never use any abrasive cleaning agents or aggressive, acidic cleaners.
- Make sure that water will not get into contact with the electrical connectors.

Hygiene when being reused:

- When the add-on bike is to be reused, it should be prepared carefully, and be wiped and treated with spray disinfectant on all surfaces which could come into contact with the user. Use a liquid, alcohol based disinfectant which is suitable for medical products and devices. Please pay attention to the manufacturer's instructions of the disinfectant you are using.

13.0 Disposal and recycling

NOTE: If the pulling device has been made available to you as part of a charity or medical loans scheme, then it may not belong to you. If it is no longer required, then follow the instructions to return it as given by the organisation that made the pulling device available to you.

Electrical and electronic equipment need to be disposed of separately to general household waste at specific state-provided locations. The correct disposal and separate collection of used appliances serves to prevent potential damage to health and the environment. It is a requirement for the re-utilisation and recycling of used electrical and electronic equipment.

Detailed information on the disposal of your used equipment can be obtained from your local authority, your waste disposal service, the specialist dealer from which you purchased the product, or your sales contact.

This information only applies to equipment which is installed and sold in the countries of the European Union and which is subject to the European directive 2002/96/EC. In countries outside of the European Union, deviating conditions apply to the disposal of electrical and electronic waste.

Materials Used:

In the following section, there is a description of the materials used on the pulling device, in view of the disposal or recycling of the pulling device and its packaging. There may also be special local regulations in force with regard to disposal or recycling, these must be taken into account when disposing of your pulling device. (This can include the cleaning or decontamination of the pulling device prior to disposal).

- Aluminium:** Wheels, steering tube, parts of the frame, main brake lever, handlebar, docking clamps
- Steel:** Frame and intermediate sub-frame, fork
- Plastic:** Handles, plugs, housing parts and tyres.
- Packaging:** Made of soft polyethylene, cardboard
- Battery:** Lithium-ion battery (hazardous product)

Please see battery section for more detailed information.



14.0 Nameplate

The nameplate is located on the frame as well as on a label in the owner's manual. The nameplate indicates the exact model designation and other technical specifications. Please provide the following pieces of information whenever you have to order replacement parts or to file a claim:



		Sunrise Medical GmbH Kahlbachring 2-4 D-69254 Malsch / Germany		2021-05-03	
TYPE: F55		Power Assist			
110 kg	max max. 6 °	15 km/h	36 Volt	max.400W	
		SN 21520262113749			

F55	Product Name/SKU Number.
max X°	Maximum safe slope, depends on wheelchair/ add-on bike setting, posture and physical capabilities of the user.
XXX kg	Load Maximum.
	CE Mark
	Directions for use
X km/h	Max speed.
XX Volt	Electrical voltage / V=Volt.
XXX Watt	Motor performance
	Cells contain lithium
	Must not be disposed of as household waste
	Serial number
	This symbol means Medical Device
	Manufacturer's address.
XXXX-XX-XX	Date of manufacture.

As we are committed to continually improving the construction of our wheelchairs and add-on bikes, product specifications may vary slightly from the examples illustrated. All weight/dimensions and performance data is approximate and is provided solely for guidance.

All products from Sunrise Medical comply with the Medical Device Regulation (2017/745).

CE All add-on bikes must be used in accordance with the manufacturer's guidelines.

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