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Quality for life

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Table of contents

1 Foreword

> **INFORMATION**
>
> Date of last update: 2021-02-15
> ► Please read this document carefully before using the product and observe the safety notices.
> ► Instruct the user in the safe use of the product.
> ► Please contact the manufacturer if you have questions about the product or in case of problems.
> ► Report each serious incident related to the product to the manufacturer and to the relevant authority in your country. This is particularly important when there is a decline in the health state.
> ► Please keep this document for your records.

> **INFORMATION**
>
> ► New information regarding product safety and product recalls as well as the declaration of conformity can be obtained at ccc@ottobock.com or from the manufacturer's service department (see inside or outside of back cover for addresses).
> ► You can request this document as a PDF file at ccc@ottobock.com or from the manufacturer's service department (see inside or outside of back cover for addresses). The PDF file can also be displayed in a larger size.

Initial adjustments to the product were made according to the order form. Nevertheless, fine adjustments and settings may have to be made depending on the medical situation or the user's requirements.

These instructions for use provide the information necessary for adjusting the settings. This work should be closely coordinated with the user.

Please note the following:
• The instructions for use (qualified personnel) are intended only for qualified personnel and remain with them.
• The manufacturer recommends checking the product settings regularly in order to assure an optimum fit over the long term. A review is required every six months for children and youths in particular.
• The manufacturer reserves the right to make technical changes to the model described in these instructions for use.

2 Intended use

2.1 Indications for use

For additional information about the indications for use, see the instructions for use (user).

The operational safety of the product can only be ensured in case of intended use in accordance with the information contained in these instructions for use (qualified personnel) and in the instructions for use (user). The user is ultimately responsible for accident-free operation.

2.2 Indications, contraindications

See the instructions for use (user) for more information about indications and contraindications.

2.3 Qualification

The tasks described below may only be carried out by qualified personnel. Compliance with all manufacturer specifications and all applicable legal provisions is required. Please contact the manufacturer's service department for further information (see inside or outside of rear cover for addresses).

3 Safety

3.1 Explanation of warning symbols

⚠ WARNING	Warning regarding possible serious risks of accident or injury.
⚠ CAUTION	Warning regarding possible risks of accident or injury.
NOTICE	Warning regarding possible technical damage.

3.2 General safety instructions

⚠ **CAUTION**

Use of unsuitable tools

Pinching, crushing or damaging the product due to use of unsuitable tools

► When completing the tasks, only use tools that are suitable for the conditions at the place of work and for which safety and the protection of health are assured with proper use.

► Observe the specifications in the section "Required Tools".

NOTICE

Improper preparation before making adjustments

Damage to the product due to falling down and failure to follow setting instructions

► When you work on the product, secure it so that it cannot tip over or fall down.

► Turn the power wheelchair off and deactivate the circuit breaker before making any adjustments. Functional tests of the electrical components are excepted from this rule.

► Before performing any work on the seat, ensure that the cushion is sufficiently protected against mechanical, chemical, and thermal effects.

3.3 Safety Instructions for Assembly

⚠ **WARNING**

Uncontrolled movement of components when making adjustments

Crushing, pinching, blows due to non-observance of the maintenance and repair instructions

► Ensure that body parts, such as hands or head, are never in the danger zone.

► Perform the work with the aid of a helper for support.

⚠ **WARNING**

Incorrect cable routing

Tipping over, falling out, burns due to assembly errors during cable installation

► Improper cable installation can lead to a loss of cable insulation and consequently to short circuits and even fires. Always install the cables so the cable insulation cannot chafe.

► Severing cables or unintentionally disconnecting plug connections while driving can cause an emergency stop of the wheelchair. This can lead to dangerous situations in road traffic. Always install the cables and plug connections so they cannot be damaged and cannot disconnect.

⚠ **WARNING**

Exposed pinch points

Pinching, crushing of limbs (e.g. fingers) due to lack of caution in danger areas

► While adjusting power seat options, note that inherent pinch and shear points are located between the seat frame and the power wheelchair frame.

► Ensure that no body parts, such as hands or feet, are in the danger zone while you make adjustments to power seat options.

> ⚠ **CAUTION**
>
> **Improper lifting**
>
> Crushing, pinching, blows due to failure to observe safety instructions
>
> ► Some parts of the power wheelchair, such as the batteries, frame, seat, and motors, are very heavy. Ensure ergonomically correct lifting of these parts. Use sufficiently large hoisting devices or perform this work with a helper.
>
> ► If it is necessary to work underneath raised parts or equipment, make sure these are secured by suitable means so that they cannot come loose, shift, or fall down.
>
> ► When using lifting platforms, ensure that the power wheelchair is centred on the platform and that no parts protrude into the danger zone.

> ⚠ **CAUTION**
>
> **Improper assembly after making adjustments**
>
> Tipping over, falling of the user due to incorrect assembly and adjustment
>
> ► Verify that the anti-tipper has been installed and adjusted properly.

> **NOTICE**
>
> **Incorrect cable routing**
>
> Plug connections coming loose or damage to the cables due to assembly errors
>
> ► Take note of the cables attached to the product with cable ties during all assembly work.
>
> ► Carefully cut the cable ties with suitable side-cutting pliers if necessary. Ensure that you do not damage the cables during this process.
>
> ► Install the cables in such a way that they cannot be damaged. Leave an appropriate cable loop on moveable components so they can move without tension.
>
> ► Only use suitable fasteners (such as cable ties). Also use cable ties to secure the plug connections to the product so they cannot be disconnected unintentionally.

3.4 Programming safety instructions

> ⚠ **WARNING**
>
> **Incorrect configuration of the control device**
>
> Falling, tipping over, collision due to incorrect parameter settings
>
> ► Note that modified parameter settings lead to changes in driving characteristics. In particular, changes to the speed, acceleration, braking or joystick settings can lead to unexpected and therefore uncontrollable driving characteristics and cause an accident.
>
> ► The parameter settings of the control device may only be changed by qualified personnel. The manufacturer of the product and the control device manufacturer are not liable in case of damage caused by parameter settings that were incorrectly configured or not adjusted properly according to the user's abilities.
>
> ► The user must test the driving characteristics of the product under the supervision of the qualified personnel each time after parameter settings are changed.

3.5 Safety instructions regarding maintenance and repairs

> ⚠ **CAUTION**
>
> **Damage to the product, unexpected noise or odours**
>
> Health problems for the user
>
> ► Report damage to the product that may cause health problems for the user to Ottobock. This includes uncontrolled movements of the product as well as sounds that are unexpected or previously not noted or odours that deviate significantly from the state of the product at the time of delivery.

3.6 Further information

> **INFORMATION**
>
> The serial number required for enquiries and ordering spare parts and accessories is found on the nameplate. For explanations of the nameplate, see the section "Nameplate" (see page 9).

3.7 Nameplate

The nameplates are found on the mobility base.

Label		Meaning
	A	Manufacturer's product name
	B	CE marking
	C	Maximum load (see section "Technical data")
	D	Maximum climbing ability (see section "Technical data")
	E	Maximum speed (see section "Technical data")
	F	Allowable axle load, front
	G	Allowable axle load, rear
	H	Allowable overall weight
	I	Manufacturer information/address
	J	Serial number[1]
	K	Manufacturing date[2]
	L	Symbol for medical device
	M	**WARNING!** Read the instructions for use before using the product. Observe important safety-related information (e.g. warnings, precautions).
	N	Symbol for separate collection of electrical and electronic devices. Components of the power wheelchair and batteries may not be disposed of in household waste.
	O	Manufacturer's reference number for the product variant
	P	Serial number (PI)[3],[1]
	Q	Global Trade Item Number (DI)[4]

[1] MMM = model/model variant; S = speed code; YY = year of manufacture; WW = week of manufacture; PP = production site; XXX = sequential production number

[2] YYYY = year of manufacture; MM = month of manufacture; DD = day of manufacture

[3] UDI-PI to GS1 standard; UDI = Unique Device Identifier, PI = Product Identifier

[4] UDI-DI to GS1 standard; UDI = Unique Device Identifier, DI = Device Identifier

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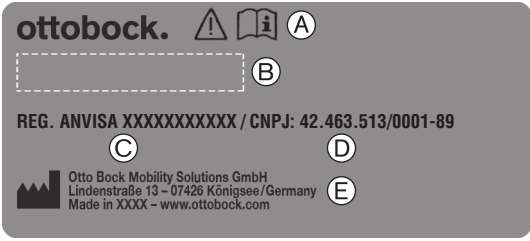
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Rótulo/etiqueta	Significado	
ottobock. ⚠ 📖 Ⓐ ▭ Ⓑ REG. ANVISA XXXXXXXXXX / CNPJ: 42.463.513/0001-89 Ⓒ Ⓓ Otto Bock Mobility Solutions GmbH Lindenstraße 13 – 07426 Königsee/Germany Ⓔ Made in XXXX – www.ottobock.com	A	**ADVERTÊNCIA!** Leia as instruções de utilização antes de usar o produto. Observe as indicações de segurança importantes (por ex., avisos, precauções).
	B	Nome do produto do fabricante
	C	Número do registro ANVISA (Agência Nacional de Vigilância Sanitária)
	D	Número do CNPJ (Cadastro Nacional da Pessoa Jurídica)
	E	Dados do fabricante/endereço

See the instructions for use (user) for additional warning labels.

4 Delivery

4.1 Scope of delivery
- Fitted power wheelchair with main components
- Options depending on equipment
- Battery charger
- Instructions for use (qualified personnel), instructions for use (user)
- Instructions for use for accessories (depending on equipment)

4.2 Accessories
The functionality and operation of the accessories are described in more detail in the instructions for use (user).

All of the available accessories are listed on the order form.

Please note that retrofitting options further reduces the maximum load capacity (user weight + luggage).

The maximum load capacity (see print on the nameplate; see page 9) is thereby respectively reduced by the weight of the retrofitted options.

4.3 Accessories from other manufacturers
As per the order for the power wheelchair, some components from third-party manufacturers had to be installed prior to delivery to the user. Please observe the information in the section "Installing accessories from other manufacturers" (see page 13).

4.4 Storage

> **NOTICE**
>
> **Deep discharge**
> Battery damage due to standby current
> ► Deactivate the circuit breaker if the product is not used for more than three days.

Storage conditions
- Store the power wheelchair in a dry, enclosed room with sufficient air circulation and protection from external influences. Specific information about storage conditions: see page 69.
- Protect the wheels against ground frost, for example by taking all weight off them using an assembly stand or by setting them onto wooden blocks.
- Maintain sufficient clearance from sources of heat. If the product is parked for an extended period of time or the tyres overheat (e.g. in the vicinity of radiators or in case of exposure to strong sunlight behind glass), the tyres may become permanently deformed.
- Fill pneumatic tyres with slight overpressure.
- Rotate the wheels weekly to prevent flat tyres from extended standing.
- For extended storage, store the power wheelchair so the wheels are not in contact with the ground.

Note regarding the tyres

- If the power wheelchair is not moved for several days, permanent colour changes may develop where it comes into contact with the ground. A suitable base should therefore be used when parking it for extended periods of time.
- Black tyres contain carbon black particles. They may leave black friction marks where they come into contact with the ground. Therefore, the manufacturer recommends grey tyres if the product is primarily used indoors.
- Avoid unnecessary parking outdoors. Direct exposure to sunlight/UV radiation causes the tyres to age more quickly. As a result, the tread surface hardens and corner pieces break out of the tread.
- The tyres must be changed when the tread is less than **1 mm (0.04")** to ensure safe driving behaviour.
- The tyres should be replaced every **2 years** regardless of wear and tear.
- When power wheelchairs with PU tyres are parked for longer periods, the tyres may become deformed (flat spots). This deformation will go away on its own over time while driving.

5 Preparing the product for use

5.1 Inserting the batteries

⚠ **WARNING**

Exposed pinch points and instability when replacing batteries

Pinching, crushing of limbs (e.g. fingers), tipping of the power wheelchair due to lack of caution when folding up the seat

- ► To safely fold up the seat, grasp the seat by the seat frame, by the backrest or by the legrest adapter. Never use the legrests themselves to fold up the seat as these do not provide a firm handhold.
- ► After folding up the seat, shake it to verify that it is firmly locked. A seat which is not firmly locked could fall back to its starting position and result in severe crushing injuries.

⚠ **CAUTION**

Short circuit of the battery

Burns due to incorrect battery installation, damage to the electrical/electronic components

- ► Deactivate the circuit breaker before performing any work on the battery.
- ► Only use insulated tools to perform maintenance work on the batteries.
- ► Ensure correct polarity when you connect the battery cables. Connect the black cable to the negative terminal and the red cable to the positive terminal.

The power wheelchair is usually delivered with the batteries installed.

If required, batteries which have been delivered separately can be installed as follows:

Folding up the seat

1) Loosen the mounting screws on the front side of the seat (see fig. 1, left) and unscrew them approx. **10 mm**.
2) Pull out the seat locking bolt (see fig. 1, right).
3) Slightly lift the seat out of the front lock.
4) Fold the seat up and back until it engages firmly.

Inserting the batteries

1) Loosen the closures of the battery cover and take the battery cover off upwards.
2) Correctly position the batteries and set them into the battery tray.
3) Connect and firmly screw in the battery cables. Observe the connection diagram in the battery cover.
   NOTICE! Make sure the polarity is correct and avoid pinch points.
4) Put on the battery cover, push it down and let the latches engage.
5) Loosen the seat locking bolt (see fig. 1, right).
6) Fold the seat down until the front lock engages.
7) Tighten the mounting screws on the front side of the seat (see fig. 1, left).

Folding up the seat

1) Loosen the mounting screws on the front side of the seat (see fig. 3, left) and unscrew them approx. **10 mm**.
2) Pull out the seat locking bolt (see fig. 3, right).
3) Slightly lift the seat out of the front lock.
4) Fold the seat up and back until it engages firmly.

Inserting the batteries

1) Loosen the closures of the battery cover and take the battery cover off upwards.
2) Correctly position the batteries and set them into the battery tray.
3) Connect and firmly screw in the battery cables. Observe the connection diagram in the battery cover.
   NOTICE! Make sure the polarity is correct and avoid pinch points.
4) Put on the battery cover, push it down and let the latches engage.
5) Loosen the seat locking bolt (see fig. 3, right).
6) Fold the seat down until the front lock engages.
7) Tighten the mounting screws on the front side of the seat (see fig. 3, left).

5.2 Activating the circuit breaker

The automatic circuit breaker has to be activated before the power wheelchair can be switched on.

It is located under the seat between the drive wheels.
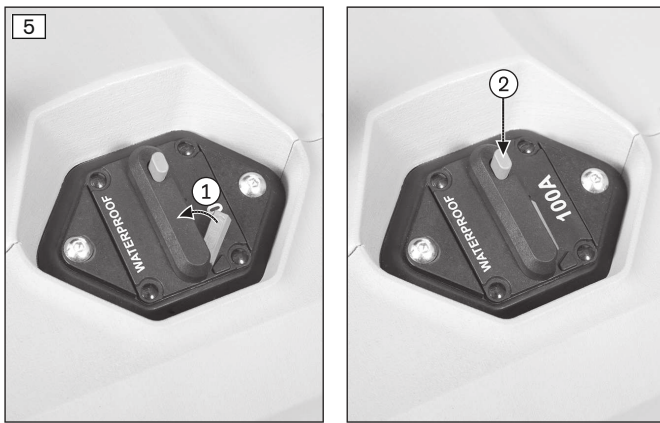
Activating the circuit breaker
► Close the reset lever, which is at an angle (see fig. 5, item 1).
→ The reset lever engages and the circuit breaker is activated.

Deactivating the circuit breaker
► Press the pushbutton until the reset lever flips up at an angle (see fig. 5, item 2).
→ The circuit breaker is deactivated.

5.3 Charging the batteries

⚠ **WARNING**

Incorrect charging or use of the battery
Injuries due to fire or explosion, damage to the battery, short circuit
► Observe the safety notices in the instructions for use (user), section "Use" > "Batteries/charging process".

⚠ **WARNING**

Insufficient ventilation of the battery charger while charging
Burns due to the battery charger overheating/catching fire
► Make sure the battery charger cannot overheat during the charging process.
► Ensure that the cooling fins/ventilation slots on the back of the device are not covered.

⚠ **CAUTION**

Wearing of unsuitable work clothing
Chemical burns due to insufficient protection
► Wear suitable work clothing (for example, gloves and protective eyewear) when working on the batteries.

See the power wheelchair instructions for use (user) for all information regarding the charging process.
The power wheelchair must be handed over to the user with fully charged batteries.

5.4 Folding the back support up/down

After unpacking, the backrest must be folded up and attached.
See the power wheelchair instructions for use (user) for more detailed information.

5.5 Installing included accessories

5.5.1 Installing the hand heater

Detailed information regarding installation can be found in the enclosed instructions for use.

5.6 Installing accessories from other manufacturers

• Accessories from other manufacturers must be intended for use on wheelchairs and must fulfil all currently applicable legal requirements.
• The work required to attach the accessories from other manufacturers must be performed by qualified personnel.
• The installation/manufacturer's instructions for the relevant accessories must be strictly observed when attaching accessories from other manufacturers.
• Ottobock assumes no liability for combinations with medical devices and/or accessories from other manufacturers outside the Ottobock modular system.

6 Settings

6.1 Prerequisites

> ⚠ **WARNING**
>
> **Making incorrect adjustments**
>
> Tipping over, falling or malposition of the user due to incorrect adjustments
>
> ► Adjustment and assembly work may be carried out only by qualified personnel.
> ► Only the adjustments described in these instructions for use may be carried out.
> ► Settings may only be changed within the allowable adjustment ranges; otherwise, the stability of the product may be impaired (see this section and the "Technical data" section). If you have questions, contact the manufacturer's service department (see inside back cover for addresses).
> ► Only conduct tests in the presence of an assistant.
> ► Unless expressly described, you may not change any settings with a person sitting in the product.
> ► Secure the user against falling out during all tests.
> ► Before testing setting changes with the user seated, firmly tighten all screw connections.
> ► Check for safe function before delivering the product.

> ⚠ **CAUTION**
>
> **Unsecured screw connections**
>
> Pinching, crushing, tipping over, falling of user due to assembly errors
>
> ► Always firmly re-tighten the mounting screws and nuts after changing settings. Observe the specified torques in doing so.
> ► Any time you loosen a screw connection with thread lock, replace it with a new screw connection with thread lock or secure the old screw connection with medium strength thread locker (e.g. Loctite 241).
> ► Always replace self-locking screws and nuts with new self-locking screws and nuts after disassembly.

Fine fitting/adjusting work should always be performed with the user. The user should sit upright in the power wheelchair while adjustments are made.

All parts of the product should be cleaned thoroughly before adjustments are made.

The tools required for adjustments and maintenance tasks as well as the torque values for screw connections are listed in the section "Appendices" (see page 79).

6.2 Basic settings

The following fitting tasks are described in more detail in the included Instructions for use (user):

• Adjusting the side panels
• Adjusting the leg supports
• Adjusting the back angle
• Adjusting the position of the control panel

6.3 Adjusting the standard seat

6.3.1 Adjusting the seat depth

> **NOTICE**
>
> **Seat depth adjustment without adjusting the centre of gravity**
>
> Worsening of the driving characteristics
>
> ► Always adjust the centre of gravity after changing the seat depth. To do so, follow the instructions in the following section.

> **INFORMATION**
>
> Please note that adjusting the seat depth changes the centre of gravity. To ensure that the driving characteristics are maintained, the seat depth after delivery of the power wheelchair may only be adjusted by **20 mm** respectively to the front or rear without additional conversion measures. The seat's centre of gravity must be adjusted for larger adjustments. See the next section for more information.

The seat depth can be adjusted by repositioning the back support to the front or back.

Repositioning the back support

1) Loosen the mounting screws on the bearing shields (see fig. 6, item 1).

   INFORMATION: Note that the position of the lap belt and seat height adapters may not be changed.

2) Reposition the back support symmetrically by a maximum of **20 mm** to the front or rear.

3) Tighten the mounting screws to **25 Nm**.

4) Check the centre of gravity. If the driving characteristics have been impaired, readjust the centre of gravity as needed. See the service manual for further information.

6.3.2 Adjusting the centre of gravity

It may be necessary to use complex conversion measures to adjust the seat's centre of gravity after changing the seat depth. This requires the following tasks:

- **Seat without lift-tilt module:** Sliding the seat frame relative to the drive platform by moving the front or front/rear seat brackets

- **Seat with lift-tilt module:** Sliding the lift-tilt module relative to the drive platform and sliding the seat frame relative to the lift-tilt module by moving the front or front/rear seat brackets

See the service manual for further information regarding the precise positioning of the seat brackets.

6.3.3 Adjusting the side panels

> **INFORMATION**
>
> Additional information regarding adjustment of the arm support height, the forearm length and the clothing guard can be found in the enclosed instructions for use (user).
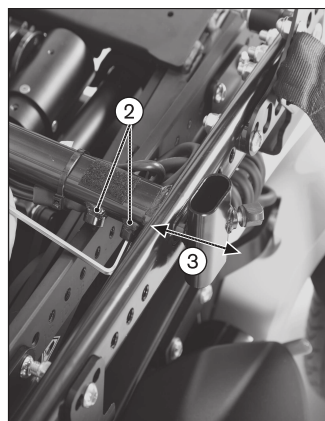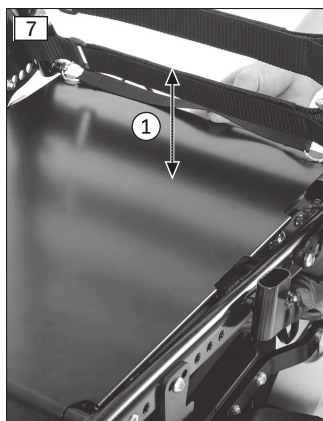
Adjusting the side panel width

1) Remove the seat plate. Do this by reaching under the seat plate from behind and pushing it up and off the seat frame (see fig. 7, item 1).

2) Loosen the mounting screws on the seat frame (see fig. 7, item 2).

3) Slide the side panel mounting to the desired position (see fig. 7, item 3).

4) Tighten the mounting screws to **10 Nm** (see fig. 7, item 2).

5) Engage the seat plate on the seat frame at the front and push it down onto the seat plate at the back (see fig. 7, item 1).

Other adjustments are not possible on the elevating side panel.

6.3.4 Adjusting the leg supports

> **⚠ CAUTION**
>
> **Improper adjustment of the leg supports and foot plates**
>
> Risk of injuries due to uncontrolled driving characteristics, damage to the product
>
> ► Make sure that the clearance between the foot plates and ground is sufficient even under load.
>
> ► Make sure that the leg supports and foot plates do not come into contact with the caster wheels under load.

The depth of the leg support and the lower leg length can be adjusted.
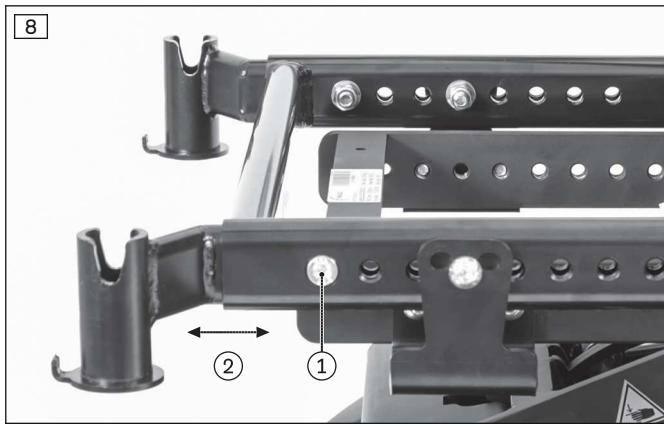
Adjusting the depth of the leg support
1) Remove the leg supports.
2) Loosen and remove the Allen head screws on both sides between the leg support holder and the seat bar (see fig. 8, item 1).
   INFORMATION: Depending on the seat setting, the Allen head screws of the seat brackets may also have to be loosened since the leg support holder may be screwed on with them as well.
3) Slide each of the leg support holders to the desired depth (see fig. 8, item 2). Ensure that the depth setting is the same.
4) Mount and firmly tighten the Allen head screws.

Adjusting the lower leg length
This setting is described in the instructions for use (user).

6.3.5 Setting the pre-tilt
The pre-tilt of the seat bottom can be subsequently changed.
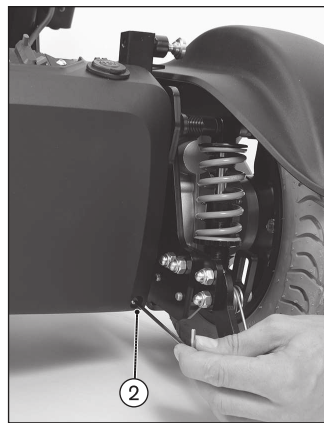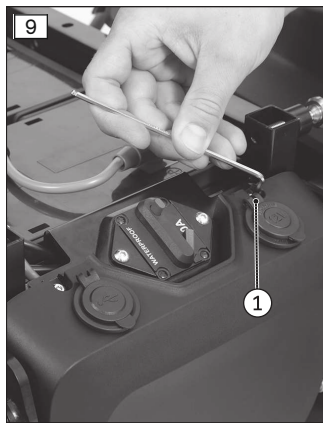
Preparatory work
1) Fold up the seat (see page 11).
2) Remove the cover on the automatic circuit breaker. Do this by loosening the mounting screws (see fig. 9, item 1/2).
3) Remove the cover.
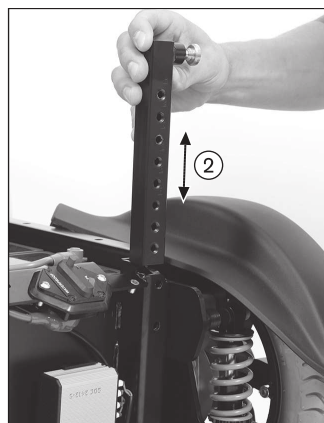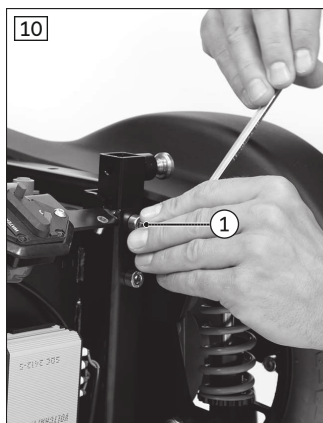
Adjusting the pre-tilt
1) Loosen the 2 Allen head screws on the adjustment tubes on both sides (see fig. 10, item 1).
2) Adjust the height of the adjustment tubes on both sides (see fig. 10, item 2). Ensure they are at the same height.
3) Firmly retighten the Allen head screws on the adjustment tubes to **25 Nm** (see fig. 10, item 1).
4) Reinstall the cover (see fig. 9).
5) Fold down the seat (see page 11).

The pre-tilt of the seat bottom can be subsequently changed.

Preparatory work

1) Fold up the seat (see page 11).
2) Remove the cover on the automatic circuit breaker. Do this by loosening the mounting screws (see fig. 11, item 1/2).
3) Remove the front cover.
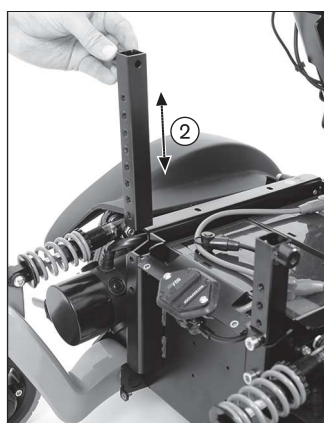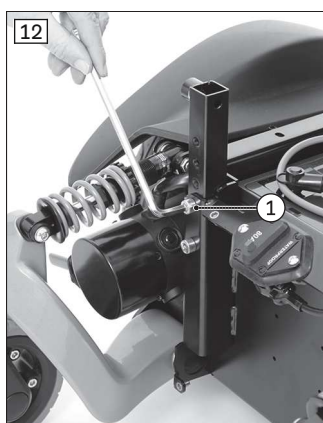
Adjusting the pre-tilt

1) Loosen the 2 Allen head screws on the adjustment tubes on both sides (see fig. 12, item 1).
2) Adjust the height of the adjustment tubes on both sides (see fig. 12, item 2). Ensure they are at the same height.
3) Firmly retighten the Allen head screws on the adjustment tubes to **25 Nm** (see fig. 12, item 1).
4) Reinstall the cover (see fig. 11).
5) Fold down the seat (see page 11).

6.3.6 Adjusting the back support upholstery

INFORMATION
A well-adjusted back support provides lasting comfort for the wheelchair user and reduces the risk of secondary damage and pressure zones.

INFORMATION
Ensure that the user's pelvis is positioned as far back in the seat as possible, i.e. between the back support tubes.

The adjustable back support upholstery can be adjusted in segments to the needs of the user. In order to properly adjust the upholstery, the user must be sitting in the wheelchair during the adjustment process.

Adjusting the back support upholstery

1) Pull the fabric of the back support pad off the hook-and-loop straps of the back support upholstery and fold it up.
2) Open and loosen the hook-and-loop straps one after the other (see fig. 13).
3) From the bottom to the top, adjust the tension of the hook-and-loop straps to the weight and anatomical condition of the user and fasten the straps one after the other.
   INFORMATION: The two ends of the hook-and-loop strap have to overlap by at least 100 mm in each case.
   INFORMATION: Adjust the respective lower hook-and-loop straps somewhat tighter. Deviating adjustments may be required in specific cases; this is the responsibility of the attending therapist.

4) Fold the fabric of the back support pad over the hook-and-loop straps and press it into place.

6.3.7 Inserting foam elements

INFORMATION
Please note that the correction pads are not included in the scope of delivery and cannot be ordered from Ottobock. Please use corresponding foam elements from your inventory.

The sitting position can be fine-tuned by using various correction pads in the backrest.

Fine-tuning the backrest

1) Open the side of the back pad. In order to do so, loosen the hook-and-loop closures of the side openings.
2) Select the correction pads as required. These can be positioned by turning/sliding to offer additional lateral guidance for the user.
3) Insert the correction pads as required.
4) Fasten the hook-and-loop closures on the side openings again.

6.4 Adjusting the VAS seat

6.4.1 Preparatory work

NOTICE
Incorrect cable routing
Plug connections coming loose or damage to the cables due to assembly errors
► Take note of the cables attached to the product with cable ties during all assembly work.
► Carefully cut the cable ties with suitable side-cutting pliers if necessary. Ensure that you do not damage the cables during this process.
► Install the cables in such a way that they cannot be damaged. Leave an appropriate cable loop on moveable components so they can move without tension.
► Only use suitable fasteners (such as cable ties). Also use cable ties to secure the plug connections to the product so they cannot be disconnected unintentionally.

The covers on the backrest and the seat plates must be removed as needed to allow you to carry out the seat adjustments described below.
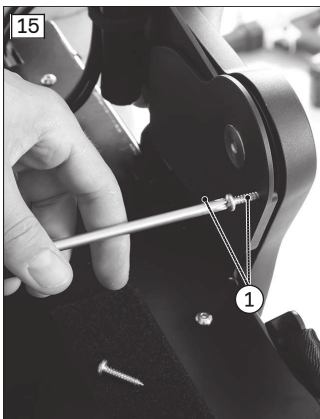
Removing/installing the cover

1) Loosen the mounting screws on the cover (see fig. 15, item 1).
2) Remove the cover (see fig. 15, item 2).
3) Reinstall the cover following completion of the adjustment work. Do so by hand-tightening the mounting screws.
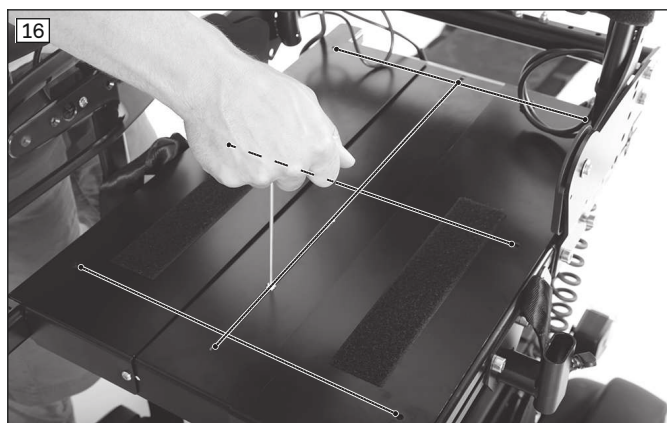
Removing/installing the seat plates

1) Loosen all mounting screws on the seat plates (see fig. 16).
2) Slightly loosen the mounting screws on the back-rest if necessary to access the seat plates (see page).
3) Remove the seat plates.
4) The seat width and centre of gravity can now be adjusted (see following section).
5) Install the seat plates and tighten the mounting screws to **4 Nm** (see fig. 16).
6) If necessary, tighten the mounting screws on the backrest to **25 Nm** (see page).

6.4.2 Adjusting the seat width

The width of the seat bottom can be adapted to the width of the cushion that is used.
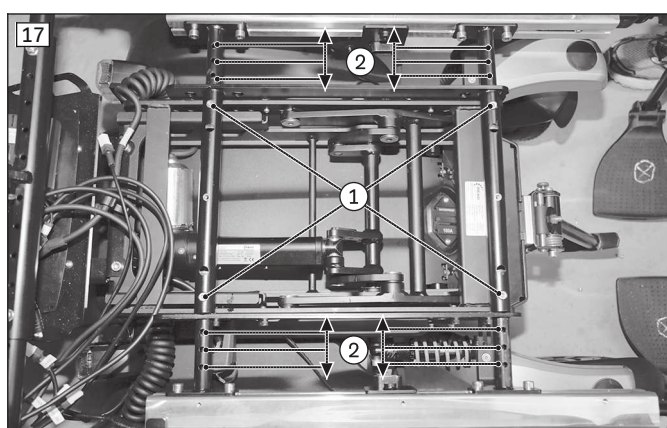
Adjusting the seat width

1) Remove the seat plates (see previous section).
2) Loosen the Allen head screws on the adjustment tubes (see fig. 17, item 1).
3) Adjust the seat width symmetrically (see fig. 17, item 2).
4) Firmly retighten all Allen head screws on the adjustment tubes to **10 Nm**.
5) Reinstall the seat plates (see previous section).

If the seat is equipped with a centrally mounted leg support, the left and right leg support holders must also be adjusted to the width of the seat. Please see the service manual for further information.

6.4.3 Adjusting the back support width

The width of the back can be adjusted in parallel to the seat bottom width.
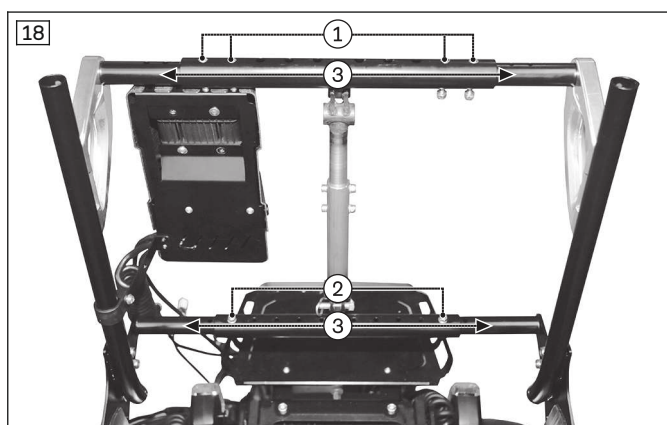
Adjusting the backrest width

1) Remove the back plate (not illustrated).
   Alternative: Open the back upholstery (procedure same as for standard seat: see page).
2) Loosen the Allen head screws on the upper connecting tube (see fig. 18, item 1).
3) Loosen the Allen head screws on the lower connecting tube (see fig. 18, item 2).
4) Adjust the width of the backrest (see fig. 18, item 3).
5) Firmly retighten all Allen head screws on the adjustment tubes to **10 Nm**.
6) Install the back plate. In doing so, tighten the mounting screws to **6 Nm**.
   Alternative: Adjust the back upholstery.

6.4.4 Adjusting the seat depth

> **NOTICE**
>
> **Seat depth adjustment without adjusting the centre of gravity**
>
> Worsening of the driving characteristics
>
> ► Always adjust the centre of gravity after changing the seat depth. To do so, follow the instructions in the following section.

> **INFORMATION**
>
> Please note that adjusting the seat depth changes the centre of gravity. To ensure that the driving characteristics are maintained, the seat depth after delivery of the power wheelchair may only be adjusted by **20 mm** respectively to the front or rear without additional conversion measures. The seat's centre of gravity must be adjusted for larger adjustments. See the next section for more information.

The seat depth can be adjusted by repositioning the back support to the front or back.

Repositioning the back support

1) Remove the cover (see page 18).
2) Loosen the back support mounting screws (see fig. 19, item 1).
3) Reposition the back support symmetrically by a maximum of **20 mm** to the front or rear (see fig. 19, item 2). Use the scale on the frame tube for guidance.
4) Tighten the mounting screws to **25 Nm**.
5) Reinstall the cover (see page 18).
6) Check the centre of gravity. If the driving characteristics have been impaired, readjust the centre of gravity as needed. See the service manual for further information.

6.4.5 Adjusting the centre of gravity

It may be necessary to use complex conversion measures to adjust the seat's centre of gravity after changing the seat depth. This requires the following tasks:

• **Seat without lift-tilt module:** Sliding the seat frame relative to the drive platform by moving the front or front/rear seat brackets
• **Seat with lift-tilt module:** Sliding the lift-tilt module relative to the drive platform and sliding the seat frame relative to the lift-tilt module by moving the front or front/rear seat brackets

See the service manual for further information regarding the precise positioning of the seat brackets.

6.4.6 Adjusting the side panels

> **INFORMATION**
>
> Additional information regarding adjustment of the arm support height, the forearm length and the clothing guard can be found in the enclosed instructions for use (user).
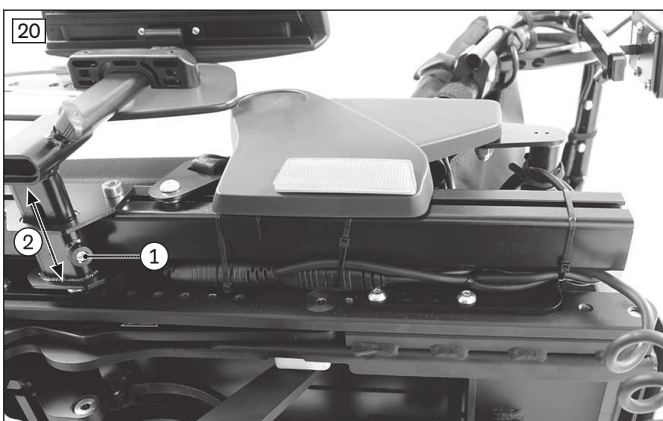
Adjusting the side panel width

1) Loosen the mounting screw on the seat frame (see fig. 20, item 1).
2) Slide the side panel mounting to the desired position (see fig. 20, item 2).
3) Tighten the mounting screws to **10 Nm** (see fig. 20, item 1).

Other adjustments are not possible on the elevating side panel.

6.4.7 Adjusting the leg supports

> ⚠ **CAUTION**
>
> **Improper adjustment of the leg supports and foot plates**
>
> Risk of injuries due to uncontrolled driving characteristics, damage to the product
>
> ► Make sure that the clearance between the foot plates and ground is sufficient even under load.
> ► Make sure that the leg supports and foot plates do not come into contact with the caster wheels under load.

The depth of the leg supports and the lower leg length can be adjusted.
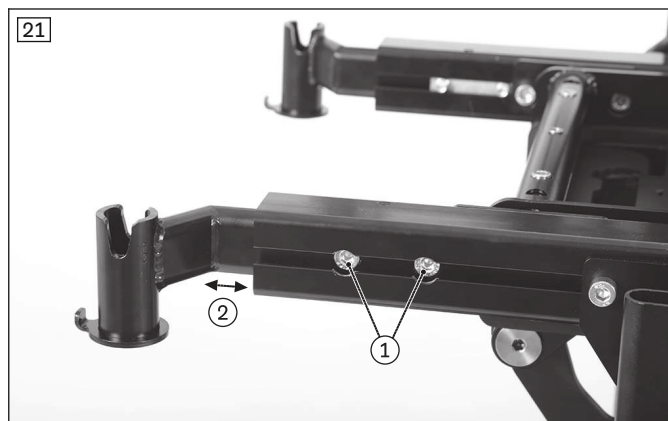
Adjusting the depth of the leg supports

1) Remove the leg supports.
2) Loosen and remove the Allen head screws on both sides between the leg support holder and the seat edge (see fig. 21, item 1).
3) Slide each of the leg support holders to the desired depth (see fig. 21, item 2). Ensure that the depth setting is the same.
4) Align each of the sliding blocks on the inside of the seat edge for assembly.
5) Mount and firmly tighten the Allen head screws.

Adjusting the lower leg length

This setting is described in the instructions for use (user).

The depth of the leg support, the lower leg length and the angle of the foot support can be adjusted.
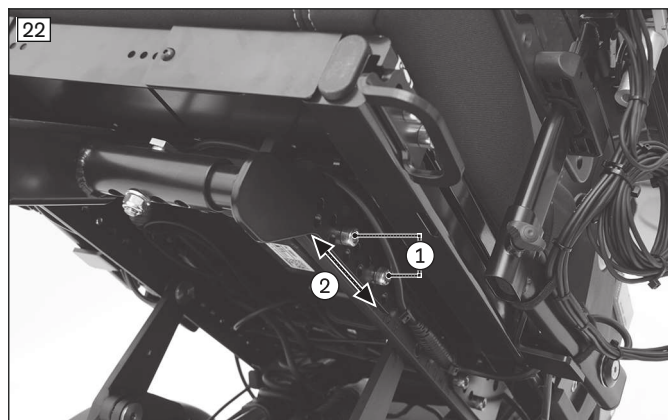
Adjusting the depth of the leg support

1) Fold the seat back (see page 11).
   If present: Move the seat tilt into a raised position.
2) **CAUTION! Pinching, crushing due to falling parts. The centrally mounted leg support and its individual parts have a substantial weight. Secure the parts against falling before loosening them.**
   INFORMATION: Depending on the configuration, the centre leg support is attached to the seat frame or the lift/tilt module. Parts of the seat may be attached to these screws. Secure and fasten these parts again immediately using the screws.
3) **If needed:** Open the cable attachments along the seat frame.
   Loosen and remove the two Allen head screws on both sides between the seat and the centrally mounted leg support (see fig. 22, item 1).
4) Adjust the depth of the centrally mounted leg support by repositioning it (see fig. 22, item 2). Ensure that the wheels cannot collide with the leg supports.
5) Insert the two Allen head screws on both sides between the seat and the leg support and tighten them firmly to **25 Nm**. **If needed:** Close the loosened cable attachments along the seat frame again.
6) Fold the seat forward again (see page 11).

Adjusting the lower leg length

This setting is described in the instructions for use (user).

Adjusting the foot support angle

This setting is described in the instructions for use (user).

6.4.8 Setting the pre-tilt
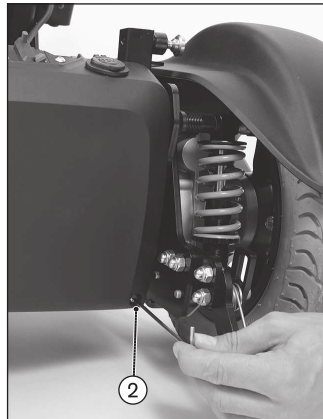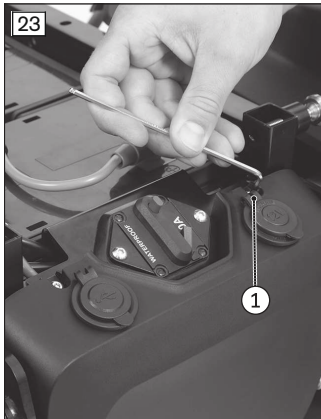
The pre-tilt of the seat bottom can be subsequently changed.

Preparatory work

1) Fold up the seat (see page 11).
2) Remove the cover on the automatic circuit breaker. Do this by loosening the mounting screws (see fig. 23, item 1/2).
3) Remove the cover.
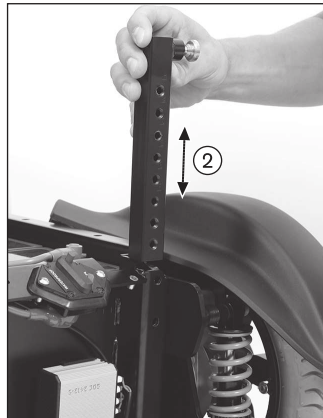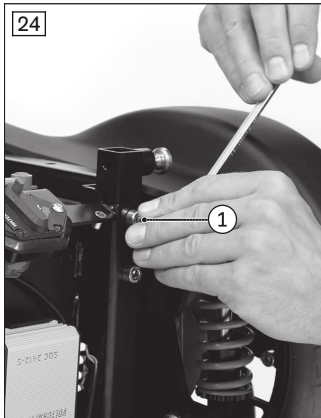
Adjusting the pre-tilt

1) Loosen the 2 Allen head screws on the adjustment tubes on both sides (see fig. 24, item 1).
2) Adjust the height of the adjustment tubes on both sides (see fig. 24, item 2). Ensure they are at the same height.
3) Firmly retighten the Allen head screws on the adjustment tubes to **25 Nm** (see fig. 24, item 1).
4) Reinstall the cover (see fig. 23).
5) Fold down the seat (see page 11).

The pre-tilt of the seat bottom can be subsequently changed.

Preparatory work

1) Fold up the seat (see page 11).
2) Remove the cover on the automatic circuit breaker. Do this by loosening the mounting screws (see fig. 25, item 1/2).
3) Remove the front cover.
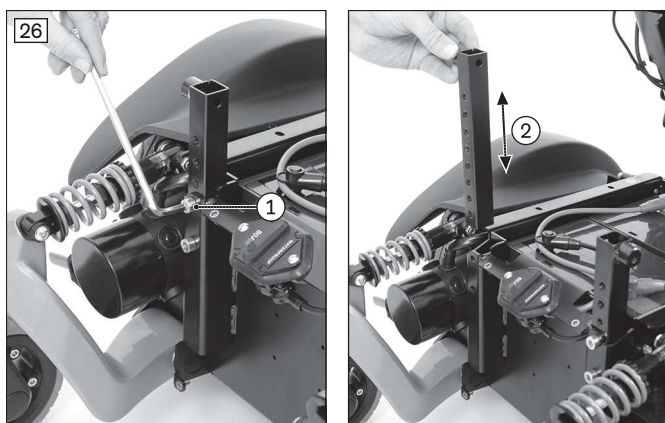
Adjusting the pre-tilt
1) Loosen the 2 Allen head screws on the adjustment tubes on both sides (see fig. 26, item 1).
2) Adjust the height of the adjustment tubes on both sides (see fig. 26, item 2). Ensure they are at the same height.
3) Firmly retighten the Allen head screws on the adjustment tubes to **25 Nm** (see fig. 26, item 1).
4) Reinstall the cover (see fig. 25).
5) Fold down the seat (see page 11).

6.4.9 Adjusting the back support upholstery

> **INFORMATION**
>
> A well-adjusted back support provides relaxed, lasting comfort and reduces the risk of secondary damage and pressure points.

> **INFORMATION**
>
> Ensure that the user's pelvis is positioned as far back in the seat as possible, i.e. between the back support tubes.

The adjustable back support upholstery can be adjusted in segments to the needs of the user. In order to properly adjust the upholstery, the user must be sitting in the wheelchair during the adjustment process.
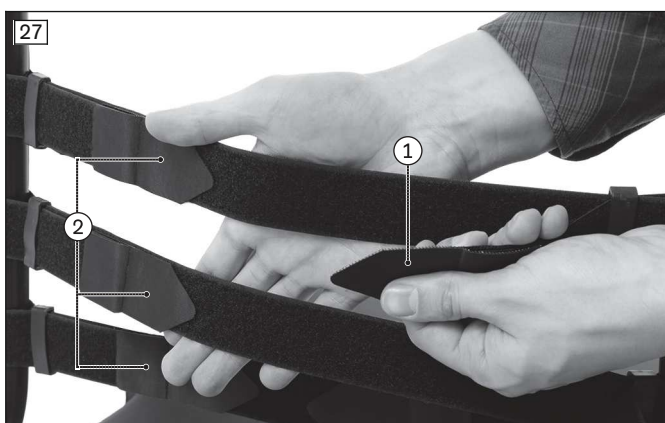
Adjusting the back support upholstery
1) Pull the fabric of the back support pad off the hook-and-loop straps of the back support upholstery and fold it up.
2) Open and loosen each of the hook-and-loop tabs (long ends) on the right side of the back straps (see fig. 27, item 1).
3) From the bottom to the top, adjust the tension of the back straps to the weight and anatomical condition of the user and fasten the straps one after the other.
   INFORMATION: The two ends of the back straps should not overlap (see fig. 27, item 1/2).
   INFORMATION: Adjust the respective lower back straps somewhat tighter. Deviating adjustments may be required in specific cases; this is the responsibility of the attending therapist.
4) Fold the fabric of the back support pad back over the hook-and-loop straps and press it into place.

6.5 Adjusting the ADI back support (Baxx line)

The ADI back support (Baxx line) is an option for installation on Ottobock power wheelchairs.
Detailed information regarding the adjustments can be found in the enclosed instructions for use. These must be provided to the user at delivery.

6.6 Adjusting the belt length

6.6.1 Safety instructions

> ⚠ **CAUTION**
>
> **Incorrect approach to the adjustment process**
>
> Injuries, malpositions, user discomfort due to adjustment errors
> - ► The qualified personnel is responsible for the individual positioning and fitting of the belt system.
> - ► Adjusting the belt system too tightly may lead to unnecessary pain or user discomfort.
> - ► Adjusting the belt system too loosely can cause the user to slide into a dangerous position. In addition, the fastening snaps could open unintentionally if they slide against hard parts of clothing (e.g. buttons).

> ⚠ **CAUTION**
>
> **Lack of instruction**
>
> Injuries, malpositions, illness of the user due to incorrect information
> - ► The qualified personnel is responsible for making sure that the user and/or attendant/nursing staff has understood the proper adjustment, use, maintenance and care of the belt system.
> - ► In particular, ensure that the user and/or attendant/care staff knows how to quickly loosen and open the product to avoid delays in case of emergency.

6.6.2 Adjusting the lap belt

Notes on the correct positioning of the user in the seat/seating system and on adjusting and applying the lap belt are found in the instructions for use (user) for this power wheelchair.

6.6.3 Adjusting other belt systems

Notes on the correct positioning of the user in the seat/seating system are found in the instructions for use (user) for this power wheelchair.

Notes on correct adjustment and application are found in the enclosed instructions for use for the belt system.

6.7 Installing and adjusting the tray

> **INFORMATION**
>
> The following information also applies when adjusting the tray of the centre tray control.

6.7.1 Scope of delivery

The product is delivered partly pre-assembled. The scope of delivery includes:

- 2 holders (already mounted on the power wheelchair if ordered):
  - 1 holder is on the arm support on the side of the control panel (see fig. 28, item 1).
  - 1 holder with quick clamp lever is on the opposite side (see fig. 28, item 2).
- Long clamping profile (already mounted on the power wheelchair if ordered)
- Swivel mechanism

6.7.2 Installation

> ⚠ **CAUTION**
>
> **Improper adjustment**
>
> Crushing or pinching due to adjustments which are too tight
> - ► Do not pinch the user when sliding in the product.

INFORMATION

► The tray can only be ordered with a swing-away control panel holder. Swing the control panel to the side during installation.

► For better representation of the installation steps, the installation was photographed without the control panel.

Positioning and attaching the tray

1) Insert the swivel mechanism into the retainer and secure it slightly with the clamping lever (see fig. 29, top left).

2) Put on and align the tray top. In doing so, check to ensure the tray retainer is centred.

3) Line up the 3 holes in the tray top with the 3 holes in the tray retainer (see fig. 29, top right).

4) Secure the tray retainer in this position with 2 screws (see fig. 29, bottom left).

5) Attach the tray top to the tray retainer with 3 screws (see fig. 29, bottom right). Carefully tighten the screws.

Mounting the supports

1) Slide the 1st support onto the clamping profile on the control panel side (see fig. 30, left).

2) Set the 2nd support onto the tube on the swivel side (see fig. 30, right).

3) Provisionally set the depth of the tray top. Clamp the swivel mechanism into place.

4) Position the supports so they can be mounted at the front and with a safety distance on the outside.

5) Mount the supports on the tray. To do so, drill 2 holes in the tray top with a diameter of 6.4 mm, respectively at the correct positions.

6) Countersink the holes with a 90° spherical countersink.

7) Attach each support with 2 of the supplied countersunk head screws. If necessary, compensate for the space between the supports and tray top with washers.

6.7.3 Adjusting the depth

INFORMATION

► Adjusting the tray to the user's body size should be performed in the presence of the user.
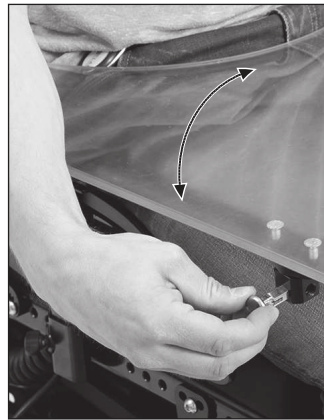
Adjusting the tray

1) Open the clamping lever on the swivel mechanism and pull the tray forward slightly (see fig. 31, left).
2) Pull the pin and swing the tray away to the side (see fig. 31, right).
3) Seat the user in the seat.
4) Fold the tray down and lock it with the pin.
5) Adjust the depth.
   CAUTION! The user must not get pinched by the tray. Ensure that the user's arms can rest on the tray and that the front, round cutout does not press on the user's body.
6) Firmly engage the clamping lever on the swivel mechanism.

7 Adjusting the control device

> ⚠ **WARNING**
>
> **Incorrect configuration of the control device**
>
> Falling, tipping over, collision due to incorrect parameter settings
>
> ► Note that modified parameter settings lead to changes in driving characteristics. In particular, changes to the speed, acceleration, braking or joystick settings can lead to unexpected and therefore uncontrollable driving characteristics and cause an accident.
>
> ► The parameter settings of the control device may only be changed by qualified personnel. The manufacturer of the product and the control device manufacturer are not liable in case of damage caused by parameter settings that were incorrectly configured or not adjusted properly according to the user's abilities.
>
> ► The user must test the driving characteristics of the product under the supervision of the qualified personnel each time after parameter settings are changed.

7.1 Programming accessories

This power wheelchair was ordered and delivered with programming accessories.

The programming accessories (handheld programming device; programming software) facilitate programming of the wheelchair control device. Further information on programming can be found in the supplied instructions for use from the control device manufacturer Curtiss-Wright or in the service manual.

7.2 Wheelchair control options

If necessary, the pre-programmed wheelchair control system can be adjusted to the specific user requirements.

Information on operation and troubleshooting of the wheelchair control unit can be found in the instructions for use (user).

The following programming information is included in the instructions for use (user):

• Programming of environmental control via Bluetooth for operating PCs (Windows) and tablets/smartphones (iDevices; Android 4.0 or higher)
• Programming of environmental control via infrared (e.g. TV, audio, video, projectors, etc.)

Some display settings are additionally explained in the instructions for use (user):

• Adjusting the display time
• Adjusting the distance display
• Adjusting the backlight

Further information on possible parameter settings can be found in the service manual or the supplied instructions for use from the control device manufacturer Curtiss-Wright.

For further information regarding programming, please see the document "PG DRIVES TECHNOLOGY R-NET OMNI2 – TECHNICAL MANUAL SK81935" from the control device manufacturer Curtiss-Wright.

7.3 Attendant control

The power wheelchair was ordered and equipped with an attendant control. It may be necessary to fit the already installed attendant control to the actual body size of the attendant.

The instructions for use (user) contain information on operating and troubleshooting the attendant control.

7.4 Memory function

The power wheelchair was ordered and equipped with a memory function.

The memory function is an additional function in "Seating" mode. The memory function is available for back support angle adjustment, seat tilt or for the combination of back support angle adjustment/seat tilt. It causes the respective seating position to stop at a preset angle. The tilt is measured by means of the R-Net Tilt Module (TM) and/or the R-Net Advanced Stability Module (ASM).

The instructions for use (user) contain detailed information on the functions and operation of the memory function.

Programming-related modifications

The respective set angle can be changed. However, this can only be implemented by qualified personnel in accordance with the manufacturer's specifications. Further information on this can be obtained from oa@ottobock.com or from the manufacturer's service department (see inside or outside of rear cover for addresses).

7.5 Push-button module

The power wheelchair has been ordered and equipped with a push-button module. The installation position of the push-button module may have to be adjusted so the user can reach it easily (see below).

The instructions for use (user) contain information on the functions and operation of the push-button module.

The service manual contains information on switching on and off controllable seat functions on the push-button module.

Programming-related modifications, e.g. changing the sequence in which the seat functions appear on the push-button module, can be implemented only by qualified personnel in accordance with the manufacturer's specifications. Further information on this can be obtained from oa@ottobock.com or from the manufacturer's service department (see inside or outside of rear cover for addresses).
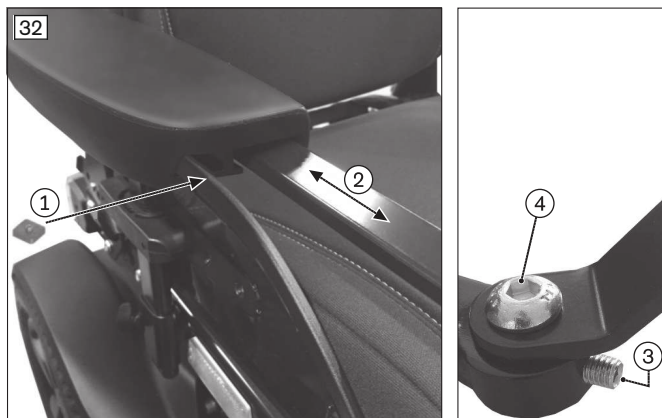
Adjusting the installation position

1) **Set the correct length.** To do so, loosen the set screw at the square nut below the arm support (see fig. 32, item 1) and set the holder to the correct length (see fig. 32, item 2). Retighten the set screw of the square nut.

2) **Set the correct angle if needed.** To do so, loosen the set screw on the holder (see fig. 32, item 3). If necessary, also loosen the Allen head screw (see fig. 32, item 4). Set the angle. Retighten the Allen head screw and the set screw.

7.6 Centre tray control

The mid-tray control is used for mechanical swivelling of the control panel on the tray of a power wheelchair.

Detailed adjustment information can be found in the section "Tray" (see page 24).

The instructions for use (user) contain information on the functions and operation of the mid-tray control.

7.7 TEN° tray module

The TEN° tray module is used for power swivelling of the integrated control panel on the tray of a power wheelchair.

Detailed information on preparation for use can be found in the enclosed 647G1446 instructions for use included with the product.

Information regarding use, cleaning and maintenance can be found in the separate 647H1446 instructions for use included with the product. They must be given to the user upon delivery of the product.

7.8 Environmental control

⚠ CAUTION

Incorrect installation and programming

Injuries due to falling, tipping over or collision of the wheelchair due to unexpected behaviour.

► Mounting, connecting and programming special controls, including the environmental control, is to be performed only by qualified personnel.

> **INFORMATION**
>
> Further information on environmental control programming using the TEN° control panel or the TEN° LCD module is found in the instructions for use (user).

7.8.1 Environmental control via Bluetooth

> **NOTICE**
>
> **Use of devices with electromagnetic emissions**
>
> Restriction of function due to electromagnetic fields
>
> ► The performance of the product can be affected by electromagnetic fields (highly radiating devices such as amateur radio or superimposed frequencies). If necessary, switch such devices off while using this product.
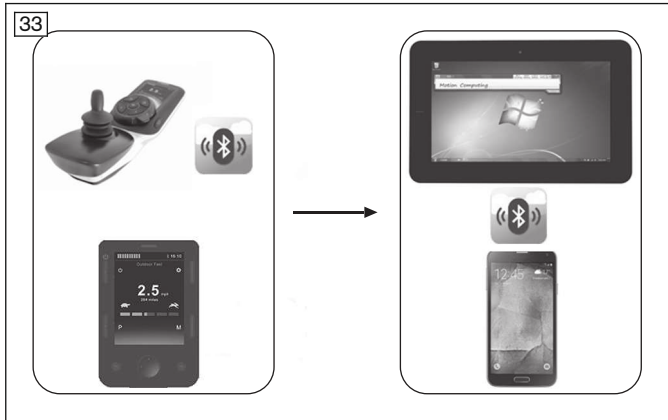
The TEN° control panel with integrated Bluetooth function or the TEN° LCD module can be used for the wireless operation of PCs, smartphones/tablets (Android 4.0 or higher) and iOS devices (iPhone, iPad).

The signals of installed input devices (such as a joystick, special control input device) are used to control the device/mouse functions.

Environmental control via Bluetooth is selected by pressing the [Profile/mode] button on the TEN° control panel or the [Mode] button on the TEN° LCD module.

The **"Bluetooth Device"** menu item is only available if Bluetooth-enabled devices have been activated. For more information about activation, see the instructions for use (user).

7.8.1.1 Cables

Environmental control via Bluetooth is available directly without separate components.

7.8.1.2 Programming
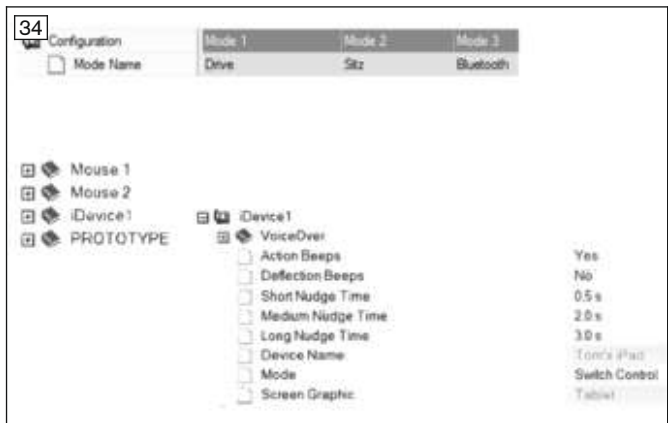
In the programming interface, **Bluetooth** has to be set as the output for the mode in which you want to implement environmental control via Bluetooth. A corresponding **Mode Name** also has to be assigned.

INFORMATION: The naming and assignment to "Mode 3" were already performed by Ottobock.

A **Device Name** parameter is available within each of the **Mouse 1**, **Mouse 2**, **iDevice1** and **iDevice2** branches. The device names displayed in the Bluetooth menu of the TEN° and on the device when establishing the connection are defined in this parameter (e.g. Tom's PC etc.).

The **Screen Graphic** parameter is used to assign an appropriate symbol (PC, tablet and smartphone) to each connected device. Reaction times, signal tones and the like can be adapted for each user with the remaining parameters. Load the configuration to the R-Net after completion.

For the assignment of the signals from installed TEN° input devices to the device functions, see the document "PG DRIVES TECHNOLOGY R-NET BLUETOOTH MODULES – TECHNICAL MANUAL SK79614" from the control device manufacturer Curtiss-Wright.

7.8.2 Environmental control via infrared (IR)
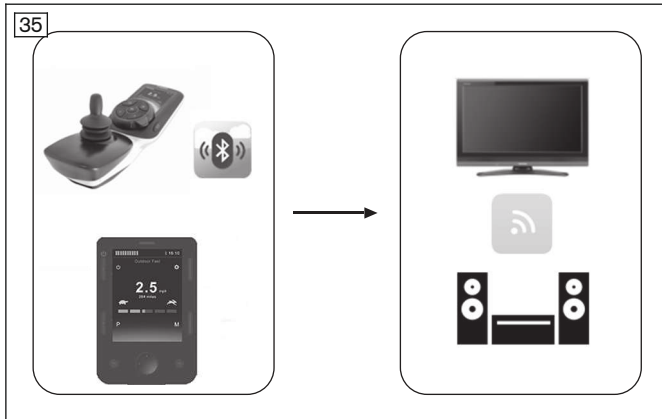
The IR function integrated in the TEN° control panel and TEN° LCD module makes it possible to control a wide range of different infrared devices.

Functions of devices in the home environment (audio, video, PC, telephone, etc.) or at work can be stored in the control device using a learning mode or programmed using a programming interface.

Environmental control via infrared is selected by pressing the [Profile/mode] button on the TEN° control panel or the [Mode] button on the TEN° LCD module.

7.8.2.1 Cables
Environmental control via infrared (IR) is available directly without separate components.

7.8.2.2 Programming
The IR Configurator of the R-Net control unit is a PC-based tool that offers the following functions:
- Creating IR user menus
- Changing IR user menus
- Saving IR user menus
- Reading IR user menus from the R-Net control unit and writing IR user menus to the R-Net control unit.

The IR Configurator can be started through the R-Net PC Programmer under **Tools/IR Configurator...**.

7.8.2.2.1 Configuring the menu tree
The left side of the IR Configurator is used to build and structure the menu tree and to set the labels.
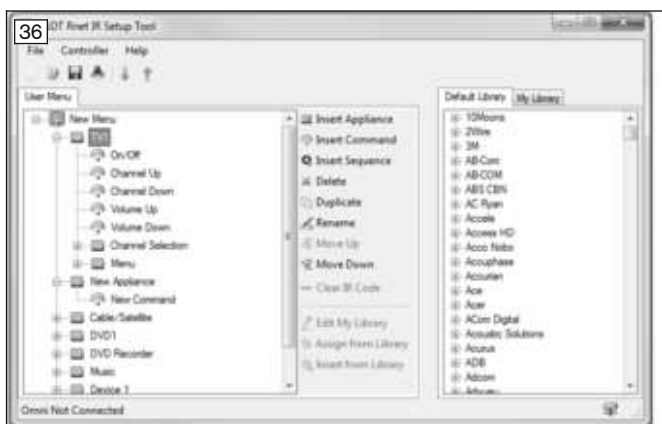
The commands available for a device are displayed by clicking the "+" symbol. If an IR code is already assigned, the command symbol is shown in colour.

The editor actions can be selected to the right of the menu tree:

Insert Appliance

A new device (appliance) can be inserted. The name can be freely edited after clicking twice.

Insert Command

A new command for a device can be inserted. The name can be freely edited after clicking twice.

Delete

The chosen entry is deleted from the user menu

Move Up, Move Down

The selected entry can be moved up or down within the user menu. These functions can also be carried out using drag and drop.

Clear IR Code

The IR code of the selected command is erased. The symbol is shown in grey (no IR code).
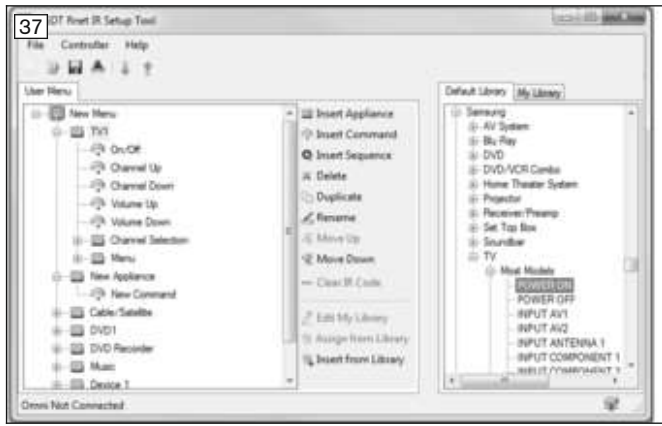
TIP: Always check the **Default Library** (to the right in the window) first to see if it contains the desired device. Then click and hold the left mouse button to drag it from the Default Library to the desired place in the user menu.

Custom IR codes can be stored in the **My Library** tab and dragged into the user menu when needed by clicking and holding the left mouse button. The custom codes are stored on the PC in the file "Mydatabase.sdf" in the IR Configurator installation folder.
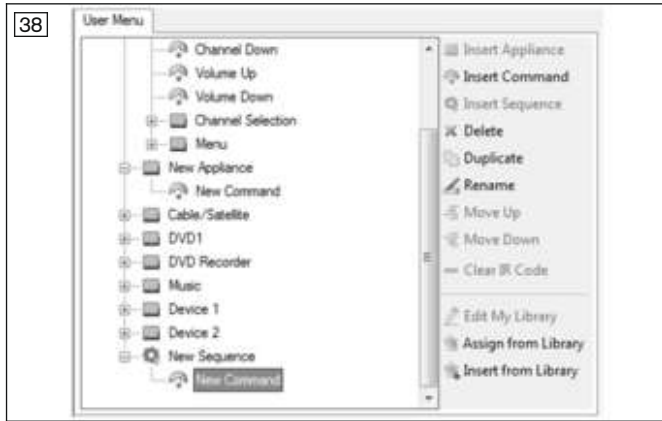
Insert Sequence

Multiple IR codes can be assigned to a command in one sequence. All IR codes contained in the sequence are output at the same time when the sequence is selected.

7.8.2.2.2 Editing the library

The **My Library** (My Library) tab allows the qualified personnel to save and collect IR codes not contained in the **Default Library** of the R-Net control unit.

The entries for the device and the assigned commands are stored on the PC in the file "Mydatabase.sdf" in the IR Configurator installation folder.
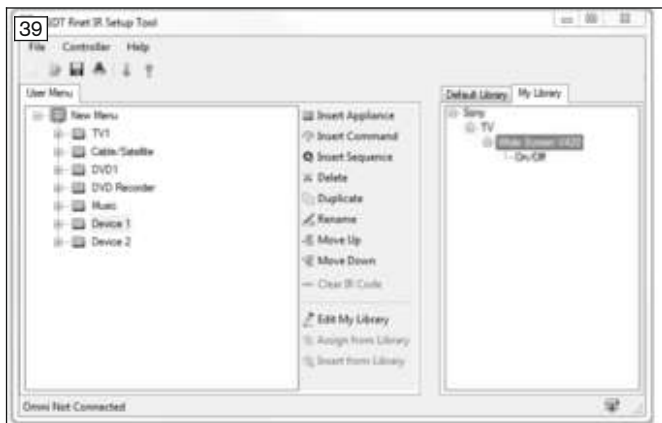
- Select the **My Library** (My Library) tab to the right in the window.
- Select **Edit My Library** (Edit My Library) in the middle of the window.

The following functions can be accessed through the **My Library** (Edit My Library) drop-down menu:

- **Add Appliance** (Add Appliance): A new device (appliance) is added to the library structure.
- **Edit Appliance** (Edit Appliance): The entry for the currently selected device (appliance) can be edited.
- **Delete Appliance** (Delete Appliance): The entry for the currently selected device (appliance) is deleted from **My Library**.
- **Clear All** (Clear All): All entries are deleted from **My Library**.

The **My Library** (My Library) function saves all IR codes within the device entry. To store a new IR code, it either has to be recorded within an existing device entry or a new device entry has to be created.

Add Appliance (Add Appliance)

The brand, type and model of the device (appliance) can be specified here.

Use the **Add** (Add) and **Delete** (Delete) buttons to add codes to the library or remove them.

7.8.2.2.3 Learning and assigning IR codes
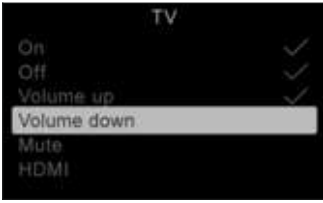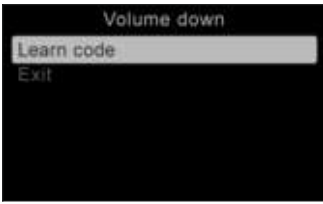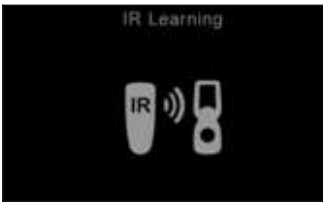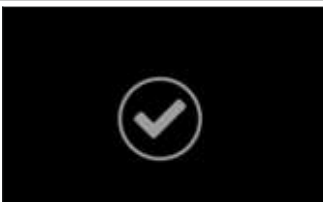
Learning prerequisites

To allow an optimal learning procedure the following recommendations should be followed:

- Put new batteries in the remote control to ensure the IR signal is of good quality.
- Avoid directly exposing the IR sensor to daylight or lamps when signals are being transferred.
- Position the remote control directly in front of the control panel or the TEN° LCD module during the learning process. When pressing a button on the remote control, make sure that the remote control remains still (do not move it back and forth during learning). The ideal distance between the remote control and TEN° control panel or TEN° LCD module is in the range of **40 to 100 mm** (1.57" to 3.94").

LCD screen in "Settings" menu

Display	Information
Settings / Distance / Backlight / Bluetooth / IR Setup	**TEN° control panel:** Open the "Settings" menu by pressing and holding the [Warning flashers on/off] button. **TEN° LCD module:** Open the "Settings" menu by pressing the [Settings] button. Using the respective installed input device (e.g. joystick, up/down and right/left navigation buttons on the TEN° LCD module, special control input devices), select the menu item [IR Setup]. • Scroll through the list: move forward/back • Select entry: move to the right
IR Setup / Printer / TV / Camera / Beamer	Select a device, e.g. [TV]. The commands which have been set up for the device are displayed.
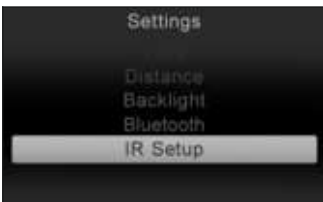
Display	Information
TV On ✓ Off ✓ Volume up ✓ Volume down Mute HDMI	Select the command which needs to be learned, e.g. [Volume down].
Volume down Learn code Exit	Select [Learn code].
IR Learning IR))) 🔲	Point the TV remote control towards the control panel or TEN° LCD module and press the desired button (e.g. [Volume down]) twice in succession. The learning progress is displayed on the control panel or TEN° LCD module in learning mode.
	INFORMATION: Hold the remote control at a distance of 40 to 100 mm (1.57" to 3.94") away from the receiver for infrared signals. **The receiver is located on the front side of the TEN° control panel or TEN° LCD module above the LCD screen (see arrow).** **Notice:** The illustration shows the receiver for infrared signals on the TEN° control panel.
✓	A tick mark indicates that the learning process was successful.
✗	If the learning process was not successful, an X is displayed. Repeat the learning process in this case.

7.8.2.2.4 Activating and deactivating IR codes

The learned IR codes can be activated or deactivated:
• Once an IR code is deactivated, it no longer appears in the user menu. The corresponding command (e.g. [Volume down]) can no longer be transmitted or executed.
• If an IR code is activated, it appears in the user menu. The corresponding command (e.g. [Volume down]) can be transmitted and executed.

LCD screen in "Settings" menu

Display	Information
Settings Distance Backlight Bluetooth IR Setup	**TEN° control panel:** Open the "Settings" menu by pressing and holding the [Warning flashers on/off] button. **TEN° LCD module:** Open the "Settings" menu by pressing the [Settings] button. Using the respective installed input device (e.g. joystick, up/down and right/left navigation buttons on the TEN° LCD module, special control input devices), select the menu item [IR Setup].

Display	Information
	Deactivating an IR code **TEN° control panel:** An IR code can be deactivated by turning the rotary multi-selector to the left. **TEN° LCD module:** An IR code can be deactivated by a movement to the left in the menu using the respective installed input device (e.g. joystick, +/- navigation buttons on the TEN° LCD module, special control input devices). A deactivated IR code appears with an "X" next to the list entry. **Activating an IR code** An IR code can be activated by the respective movement to the right. An activated IR code appears with a tick mark next to the list entry.

7.8.2.2.5 Configuring IR control mode

Mode 4 is configured as the IR control mode at the factory. If this programming has been overwritten, the programming shown here may have to be restored. Restoring the programming is required if the IR user menu cannot be accessed after learning IR codes.

7.8.3 Wireless environmental control

Further information regarding environmental control via the separate wireless module:

8 Special controls

8.1 Introduction

The power wheelchair was ordered and equipped with special controls.

When special controls are installed, the control functions are not carried out using the standard joystick on the control panel but using modular components (such as sip and puff control, chin control, mini/midi joystick control).

Special controls which are already pre-programmed may have to be adapted to the user's specific requirements.

Please note the following:

• Knowledge of the following sections is mandatory for programming and required mechanical adjustments to the supplied special control.

• These instructions for use only explain the programming for the parts of the special control installed in the delivered product.

• The respective special control consists of a modular component designed to individually adapt the power wheelchair and can only operate in conjunction with the latter.

• The special control is intended exclusively as an option for an Ottobock power wheelchair with an R-Net control device. The manufacturer assumes no liability for combinations with third-party medical devices and/or accessories not included in the modular system.

• Further information on the installation and programming of all special control versions can be found in the instructions for use, "R-Net special controls and environmental control" (instructions for use (qualified personnel): 647G1242; instructions for use (user): 647G1243).

• For further information regarding the use of a TEN° LCD module, please see the document "PG DRIVES TECHNOLOGY R-NET OMNI2 – TECHNICAL MANUAL SK81935" from the control unit manufacturer Curtiss-Wright.

8.2 Safety Instructions for Assembly

> ⚠ **WARNING**
>
> **User switch and on/off switch not accessible in emergency situations or not functional**
>
> Severe injuries to the user due to falling, tipping over, collision of the wheelchair
>
> ► The user switch and on/off switch serve as an EMERGENCY STOP. Install the switches so they are readily accessible by the user in emergency situations, for example in case of uncontrolled driving behaviour of the wheelchair.

> ⚠ **CAUTION**
>
> **Incorrect installation and programming**
>
> Injuries due to falling, tipping over or collision of the wheelchair due to unexpected behaviour.
>
> ► Mounting, connecting and programming special controls, including the environmental control, is to be performed only by qualified personnel.

> **NOTICE**
>
> **Incorrect cable routing**
>
> Damage to cables due to pinching
>
> ► When positioning the cables make sure that they cannot be pinched.

> **NOTICE**
>
> **Connection work on equipment that is switched on**
>
> Damage to electrical components
>
> ► Any connection work on the special controls and the environment control must be carried out only when the equipment is switched off.

> **INFORMATION**
>
> Prior to using the respective special control, all necessary mechanical adaptations and software settings must be completed according to the individual requirements and abilities of the user. Settings may only be changed by qualified personnel.

8.3 General

Depending on the configuration, the special control can be switched on or off using the following methods:

* On/off switch on the control panel
* On/Off switch on the TEN° LCD module
* External on/off switch

A switch-off time can be set by the qualified personnel. This can automatically switch off the control unit after a specified period of time. The switch-off time can be deactivated.

8.3.1 TEN° LCD module

The special control was ordered and delivered with the TEN° LCD module.

8.3.1.1 Dimensions and installation
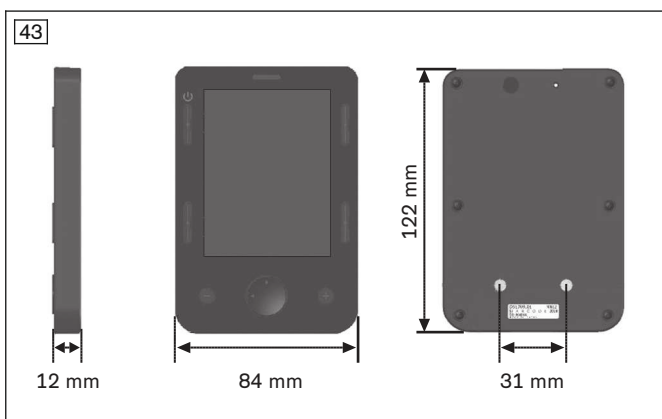
The TEN° LCD module consists of the display module (top) and connection module (bottom).

The dimensions of the TEN° LCD module are shown in the illustrations (all sizes in mm).

If installation is required: Various holders on the order form can be used for optimal positioning of the display module.

Mount the display module as follows:

1) Slide the holder (standard holder, holder with height and lateral adjustment, holder with gooseneck) onto the attachment rail located beneath the forearm support and attach it with two set screws.
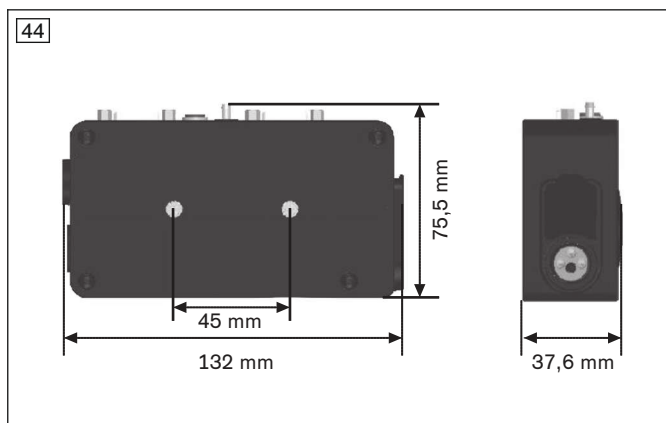
2) Fasten the display module to the holder with 2x M4 Allen head screws.

3) Connect the display module to the connection module.

INFORMATION: For detailed information on installing the display module and connection module, see the service manual for the power wheelchair.

8.3.1.2 Connections

Connections on the connection module
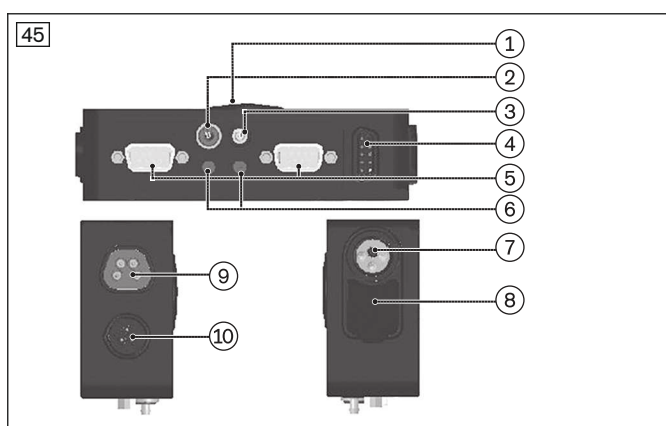
1   Speaker

2   On/off switch jack

3   Connection for sip and puff control

4   Display module/connection module connection jack

5   D-SUB input port 1/2:

6   Jack U1/U2

7   Charging receptacle

8   USB connection

9   Connection jack (reserved for future use)

10   Communication jack (input for connecting cable)

Speaker
For certain command inputs, audible feedback is generated using the speaker.

On/off switch jack
When a special input device (such as a chin control or sip and puff control) is used, an external on/off switch has to be connected here. It is connected with a 3.5 mm jack plug.

Connection for sip and puff control
A 3.5 mm (1/8") diameter hose equipped with a mouthpiece can be connected to this port. The sip and puff control is assigned to port 1.

Display module/connection module connection jack
The display module is connected to the connection module here using the display cable.

D-SUB input port 1/2
The input devices for the special controls (such as joysticks or button adapters) are connected to the D-SUB port. The connector is a 9-pin D-SUB plug with socket contacts. If only one input device is used, it always has to be connected to port 1.

U1/U2 jacks
The user switches for port 1/port 2 are connected to the U1/U2 jacks. A 3.5 mm jack plug is used for the connection.

Charging receptacle
The charging receptacle can be used to connect the charging cable or for the connection to the external charging receptacle.

USB connection (type A)

The connection can be used to charge devices with a standard USB battery charger.

Connection jack

This connection is reserved for future use.

Communication jack

The connection module is connected to the R-Net system (e.g. bus distributor, controller) here using the connecting cable.

8.3.2 Programming

> ⚠ **WARNING**
>
> **Incorrect configuration of the control device**
>
> Falling, tipping over, collision due to incorrect parameter settings
>
> ► Note that modified parameter settings lead to changes in driving characteristics. In particular, changes to the speed, acceleration, braking or joystick settings can lead to unexpected and therefore uncontrollable driving characteristics and cause an accident.
>
> ► The parameter settings of the control device may only be changed by qualified personnel. The manufacturer of the product and the control device manufacturer are not liable in case of damage caused by parameter settings that were incorrectly configured or not adjusted properly according to the user's abilities.
>
> ► The user must test the driving characteristics of the product under the supervision of the qualified personnel each time after parameter settings are changed.

Programming of the R-Net control unit can be performed via:
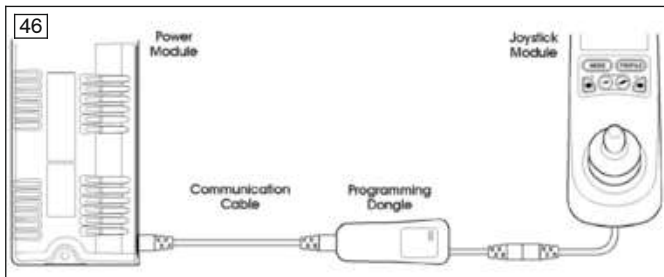
• On-board programming with the programming dongle interconnected between the controller and control panel.
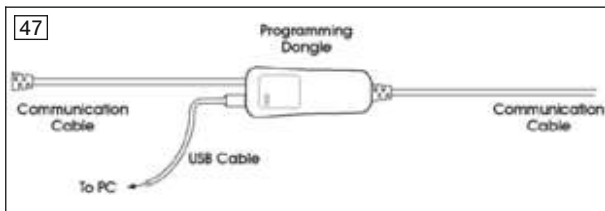
• Programming per PC software / interface cable with the programming dongle.

For further information regarding the installation and application of the programming tools, please see the document "PG DRIVES TECHNOLOGY R-NET - TECHNICAL MANUAL SK77981/11" from control unit manufacturer Curtiss-Wright.

8.3.2.1 Activating programming mode (OBP)

> **INFORMATION**
>
> Always back up the current configuration state before changing the programming. This can only be done by connecting a PC. On-board programming mode (OBP) is deactivated in the standard settings to ensure that the PC must first be connected in order to back up the configuration before making any changes.

1) Activate OBP mode through the PC programming interface using the parameter **Profile Management/Mode Enable** (see page 37) to enable Mode 8 (Programming).
2) Remove the connecting cable to the PC.
3) Turn the R-Net control device off.
4) Connect the dongle either between two components of the control system (such as the controller and control panel) or to an available communication port.
5) Turn the R-Net control device on
6) On the TEN° LCD module, use the [Mode] button to reach OBP mode.

7) After all changes have been made, deactivate Mode 8 (Programming) again using the PC via the parameter **Profile Management/Mode Enable** (see page 37) and back up the configuration once more.

8.3.2.2 Using the PC programming interface

The R-Net control unit can be programmed with the PGDT R-Net programming software using a conventional PC.

The following description provides an overview of the programmable parameters.

For detailed information regarding programming, please see the document "PG DRIVES TECHNOLOGY R-NET - TECHNICAL MANUAL SK77981/11" from the control unit manufacturer Curtiss-Wright as well as the online help for the PGDT R-Net programming software.

For further information regarding programming of the TEN° LCD module, please see the document "PG DRIVES TECHNOLOGY R-NET OMNI2 – TECHNICAL MANUAL SK81935-0B" from the control unit manufacturer Curtiss-Wright as well as the online help for the PGDT R-Net programming software.

8.3.2.3 Programming philosophy

Operation of the R-Net control device is based on a concept of profiles and operating modes.

A profile is a collection of programmable parameters which influence the operation and performance of the wheelchair. There is generally a profile for each input device (such as a standard control panel, special control element, IR environmental control, attendant control and so on).

Typical examples of operating modes are **Drive** and **Seating** (electrical seat functions). The user can select the desired operating mode using the [Profile/Mode] button on the control panel.

Profile management

The R-Net control device offers up to eight profiles. The **Profile Enable** parameter under **Profile Management** is used to select whether a profile is visible to the user.

The LCD screen on the control panel shows the currently selected profile as a text string with up to 20 characters. The number of the profile is also shown.

Managing the operating modes

Seven different operating modes can be selected within every available profile. A standard wheelchair normally has just two operating modes: **Drive** (mode 1) and **Seating** (mode 2).

The **Mode Enable** parameter controls whether or not an operating mode is available.

8.3.2.4 Creating the profile for special controls

First, the profile for the special control is created under **Profile Management**. To change the parameters, double-click the respective field with the mouse. Profiles for various configurations of special controls are predefined at the factory and need only be activated.

Example 1: special control operated on port 1 of the TEN° LCD module

1) Profile 2 is predefined for connecting a special control to the port 1.
2) Set the **Profile Enable** parameter to **Yes**.

Example 2: special control operated on port 2 of the TEN° LCD module

Parameter		Profile 1	Profile 2	Profile 3
Profile Management				
	Profile Name	Drive	Specialty Control 1	Specialty Control 2
	Profile Enable	Yes	No	Yes
	Mode Enable	[1234567]	[1234567]	[1234567]
	Input Device Type	JSM	Omni	Omni
	Input Device Subtype	All	All	All
	Seat Reversal Profile	No	No	No
	Allow Grab	Yes	Yes	Yes

1) Profile 3 is predefined for connecting a special control to the port 2.
2) Set the **Profile Enable** parameter to **Yes**.

Example 3: special control connected directly to the bus system (without TEN° LCD module)

Parameter		Profile 1	Profile 2	Profile 3	Profile 4
Profile Management					
	Profile Name	Drive	Specialty Control 1	Specialty Control 2	Specialty Control
	Profile Enable	Yes	No	No	Yes
	Mode Enable	[1234567]	[1234567]	[1234567]	[1234567]
	Input Device Type	JSM	Drive	Omni	JSM
	Input Device Subtype	1	All	All	2
	Seat Reversal Profile	No	No	No	No
	Allow Grab	Yes	Yes	Yes	Yes

1) Profile 4 is predefined for connecting a special control directly to the bus system.
2) Set the **Profile Enable** parameter to **Yes**.
3) In profile 1, set the **Input Device Subtype** parameter to 1.

Example 4: special control operated via an input/output module (IOM)

Parameter		Profile 1	Profile 2	Profile 3
Profile Management				
	Profile Name	Drive	Specialty Control 1	Specialty Control 2
	Profile Enable	Yes	No	Yes
	Mode Enable	[1234567]	[1234567]	[1234567]
	Input Device Type	JSM	Omni	IOM 1
	Input Device Subtype	All	All	All
	Seat Reversal Profile	No	No	No
	Allow Grab	Yes	Yes	Yes
Configuration		Mode 1	Mode 2	Mode 3
Speeds		Drive	Specialty Control 1	Specialty Control 2
Controls				
Latched		Drive	Specialty Control 1	Specialty Control 2

1) No specific profile is predefined for using an input/output module (IOM) in the special control (e.g. with push-button control). Profile 3 is configured for this in the example.
2) In Profile 3, set the **Profile Enable** parameter to **Yes**.
3) In profile 3, set the **Input Device Type** parameter to **IOM 1**.
4) The rotary switch (DIP switch) in the IOM must be set to "0". For further information, see the corresponding section for button control or wireless environmental control. For further information, please see the document "R-NET INPUT/OUTPUT MODULE – TECHNICAL MANUAL SK78814" from the control device manufacturer Curtiss-Wright.

Adjustable parameters

The parameters that can be adjusted under **Profile Management** are described in the following table:

Parameter	Setting range	Description
Profile Name	Text	Text string of 20 characters displayed on the LCD screen of the control panel or TEN° LCD-module indicating that the profile is selected.
Profile Enable	Yes, No	Setting that defines whether the profile can be selected by the user.
Mode Enable		Setting that defines which operating modes are available in each

Parameter	Setting range	Description
	Displayed drop-down list	profile. Select the corresponding menu item to activate the mode. Selected modes are displayed with a blue background. Any desired combination of modes can be selected (illustration to the left below the table). After closing the drop-down menu, the selected modes are shown as numbers.
Input Device Type	Displayed drop-down list	All profiles can be configured so that they work with any type of input device or only with a certain type of input device. For special controls that use the TEN° LCD module, **Omni** must be set here, for example (illustration to the right below the table). This is also where the parameters **Input Device Subtype** and **Allow Grab** (see below) can be configured.
Input Device Subtype	All, 1, 2	This parameter is relevant only when two identical input devices have to be connected, otherwise it is ignored. When the parameter is set to **All**, the profile can be controlled with all input devices of this type.
Seat Reversal Profile	Yes, No	This parameter is not used with Ottobock wheelchairs.
Allow Grab	Yes, No	This parameter specifies whether an input device will allow another input device type to assume control. When this parameter is selected by double-clicking, the dialogue field shown in the illustration to the right below the table is displayed. The **Allow Grab** checkbox there can either be checked or not.
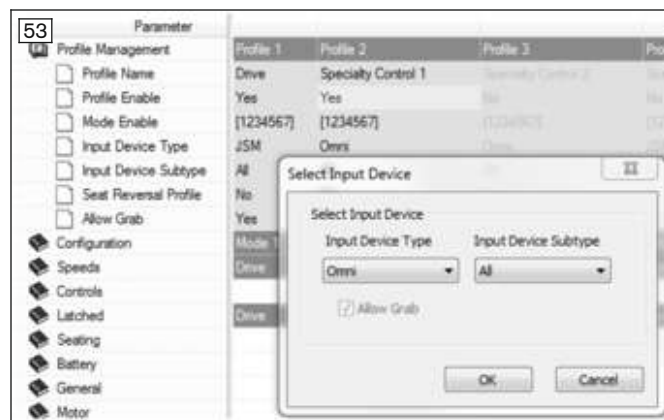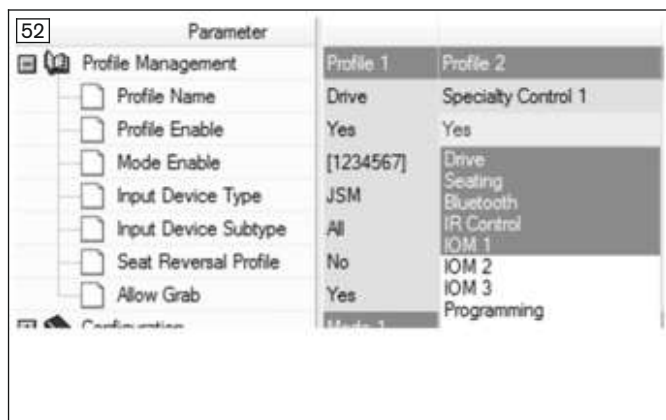
8.3.2.5 Adapting the special control type

The TEN° LCD module is compatible with the following types of special controls:

- Joystick control (4 directions) and user switch
- Joystick control (3 directions) and user switch
- 4-button control and user switch
- 3-button control and user switch
- 1-button control (scanner)
- Sip and puff control and user switch.

The user switch serves as the emergency stop and for switching to the user menu and standby mode. While operation without a user switch is also possible in principle, using a user switch is highly recommended for safety reasons.

The type being used is set in the programming software under **Omni/Ports/SID** in the SID parameter.

Parameter	Setting range	Description
SID	Proportional, 4-button control (Switch) 3-axis proportional, 3-axis switch,	Type of connected special control (Specialty Input Device, SID), see below for explanations.

Parameter	Setting range	Description
	Sip and puff, Scanner	

> **INFORMATION**
> ► Alternatively certain special control versions can also be connected to the input/output module (IOM): proportional: joystick control (4 directions); switch: 4-button control.
> ► To adjust the parameters when using the input/output module (IOM), configure the following settings in the programming software: "Input Output Module" --> "Input Module" --> "Input Type" --> under "Input 1" --> "Switch" (4-button control) or "Proportional" (joystick control).

Proportional: joystick control (4 directions) and user switch

Typical applications are chin controls and joysticks, with operation adapted to the force the user is able to generate. The joystick is connected to the 9-pin D-Sub plug connector on the TEN° LCD module (see page 35). In addition, a user switch configured as normally open should be connected to the 3.5 mm jack.

Switch: 4-button control and user switch

The application includes 4 direction switches and a user switch connected via the adapter box on the 9-pin D-Sub plug connector of the TEN° LCD module (see page 35). In addition, a user switch configured as normally open can be connected to the 3.5 mm jack.

3-axis proportional: joystick control (3 directions) and user switch

Typical applications are chin controls equipped with a joystick.

The joystick is connected to the 9-pin D-Sub plug connector on the TEN° LCD module (see page 35). In addition, a user switch configured as normally open should be connected to the 3.5 mm jack.

3-axis switch: 3-button control and user switch

Button-based head control is a typical application.

The application includes 3 direction switches and a user switch connected to the 9-pin D-Sub plug connector on the TEN° LCD module (see page 35).

Sip and puff: sip and puff control and user switch

A sip and puff mouthpiece is connected to the pneumatic port of the TEN° LCD module (see page 35). In addition, a user switch configured as normally open should be connected to the 3.5 mm jack.

Scanner: 1-button control

With 1-button control, also known as LED control, the driving directions and menu functions are selected using a button. For this purpose, the display runs through a frequency that can be programmed, and the function that is displayed when the button is pressed is executed.

8.3.2.6 Adapting the driving characteristics

After programming to specify the type of special control (SID) is complete, the driving characteristics need to be adapted to the user.

In order to allow the user to become accustomed to the elements of the special control, we recommend starting with the lowest speed level before increasing the speed settings.

The speed settings are also configured via the R-Net programming interface.

The following parameters can be set under **Speeds**:

Parameter	Setting range	Description
Maximum Forward Speed	Single steps from 0 to 100%	Speed for forward driving of the wheelchair when the joystick is pushed completely forwards and the highest speed level is set (all 5 bars illuminated).

Parameter	Setting range	Description
Minimum Forward Speed	Single steps from 0 to 100%	Speed for forward driving of the wheelchair when the joystick is pushed completely forwards and the lowest speed level is set (only 1 bar illuminated). The value of the minimum forward speed cannot be set higher than the value for the maximum forward speed.
Maximum Reverse Speed	Single steps from 0 to 100%	Speed for reverse driving of the wheelchair when the joystick is pushed completely back and the highest speed level is set (all 5 bars illuminated).
Minimum Reverse Speed	Single steps from 0 to 100%	Speed for reverse driving of the wheelchair when the joystick is pushed completely back and the lowest speed level is set (only 1 bar illuminated).
Maximum Turning Speed	Single steps from 0 to 100%	Speed for turning and rotating the wheelchair when the joystick is pushed completely to the left or right and the highest speed level is set (all 5 bars illuminated).
Minimum Turning Speed	Single steps from 0 to 100%	Speed for turning and rotating the wheelchair when the joystick is pushed completely to the left or right and the lowest speed level is set (only 1 bar illuminated). The value of the minimum turning speed cannot be set higher than the value for the maximum turning speed.
Maximum Forward Acceleration	Single steps from 0 to 100%	Rate of acceleration of the wheelchair during forward driving when the highest speed level is set (all 5 bars illuminated).
Minimum Forward Acceleration	Single steps from 0 to 100%	Rate of acceleration of the wheelchair during forward driving when the lowest speed level is set (only 1 bar illuminated). The value of the minimum forward acceleration rate cannot be set higher than the value for the maximum forward acceleration rate.
Maximum Forward Deceleration	Single steps from 0 to 100%	Rate of deceleration of the wheelchair during forward driving when the highest speed level is set (all 5 bars illuminated).
Minimum Forward Deceleration	Single steps from 0 to 100%	Rate of deceleration of the wheelchair during forward driving when the lowest speed level is set (only 1 bar illuminated). The value of the minimum forward deceleration rate cannot be set higher than the maximum forward deceleration rate.
Maximum Reverse Acceleration	Single steps from 0 to 100%	Rate of acceleration of the wheelchair during reverse driving when the highest speed level is set (all 5 bars illuminated).
Minimum Reverse Acceleration	Single steps from 0 to 100%	Rate of acceleration of the wheelchair during reverse driving when the lowest speed level is set (only 1 bar illuminated). The value of the minimum reverse acceleration rate cannot be set higher than the value for the maximum reverse acceleration rate.
Maximum Reverse Deceleration	Single steps from 0 to 100%	Rate of deceleration of the wheelchair during reverse driving when the highest speed level is set (all 5 bars illuminated).
Minimum Reverse Deceleration	Single steps from 0 to 100%	Rate of deceleration of the wheelchair during reverse driving when the lowest speed level is set (only 1 bar illuminated). The value of the minimum reverse deceleration rate cannot be set higher than the maximum reverse deceleration rate.
Maximum Turn Acceleration	Single steps from 0 to 100%	Rate of acceleration of the wheelchair during turning and negotiating curves when the highest speed level is set (all 5 bars illuminated).
Minimum Turn Acceleration	Single steps from 0 to 100%	Rate of acceleration of the wheelchair during turning and negotiating curves when the lowest speed level is set (only 1 bar illuminated). The value of the minimum turn acceleration rate cannot be set higher than the value for the maximum turn acceleration rate.
Maximum Turn Deceleration	Single steps from 0 to 100%	Rate of deceleration of the wheelchair during turning and negotiating curves when the highest speed level is set (all 5 bars illuminated).
Minimum Turn Deceleration	Single steps from 0 to 100%	Rate of deceleration of the wheelchair during turning and negotiating curves when the lowest speed level is set (only 1 bar illumin-

Parameter	Setting range	Description
		ated). The value of the minimum turn deceleration rate cannot be set higher than the maximum turn deceleration rate.
Power	Single steps from 0 to 100%	Reduction of wheelchair power. Power indicates here the capacity of a wheelchair to drive up a hill or to overcome an obstacle. When the value is set to 100%, the wheelchair delivers full power. Values under 100% result in a power reduction. This can be applied to prevent damage to doors or furniture when the wheelchair is used indoors, for example. The values can be set independently of one another in the driving profiles, i.e., separate profiles can be defined for indoor and outdoor use.
Torque	Single steps from 0 to 100%	This parameter can be used to increase the current for the motors at low driving speeds. This is useful for overcoming obstacles such as doorsteps or thick carpets or when the wheelchair rolls backwards. The parameter has no effect at 0%. The recommended value is 80%, but this value should be reduced if the wheelchair becomes too jerky.
Tremor Damping	Single steps from 0 to 100%	This parameter can be used to reduce the impact of a user's hand tremor on joystick operation. The higher the set value, the greater the damping effect. **CAUTION** When high values are entered to suppress tremors, pay particular attention to the braking distance of the wheelchair, which then becomes longer.

8.3.2.7 TEN° LCD module

8.3.2.7.1 General behaviour of the TEN° LCD module

The way in which input via the peripherals of the special controls is interpreted and processed in the controller is configured under **Omni/Ports/Controls**.

Parameter	Setting range	Description
User Control	Sequence, Menu	Use of the special controls and/or the input device to select the available profiles and modes. • **Sequence**: Operating the input device switches to the next available profile or the next mode. The sequence is then programmable (see page 44). • **Menu**: Operating the input device displays a user menu with all available profiles and modes. The special control is then used to navigate in the menu. The sequence of menu items in the user menu is programmable (see page 44).
Return To	Drive, Menu	Effects of briefly operating the input device (user switch) in a mode other than driving mode when the user control parameter is set to **Menu**. • **Drive**: When the input device (user switch) is operated briefly in a mode other than driving mode, this switches back to driving mode. • **Menu**: Briefly operating the input device (user switch) displays the user menu. When using special controls with 1-button scan, this parameter is used to set where the system returns to when the **Exit** option is selected, the input device is operated and the user does not have driving mode selected.
Timeout to Menu	0 to 60 s in increments of 1 s	Length of time the special control must be inactive before the user menu is displayed. When it is set to 0, this method does not display the user menu.
Menu Navigation	Normal, Invert	Inverts the navigation direction for the user menu. This parameter cannot be changed for special controls with 3 axes.

Parameter	Setting range	Description
		• **Normal**: Moving the special control forwards navigates up in the user menu. • **Invert**: Moving the special control forwards navigates down in the user menu.
Menu Scan Rate	0 s to 10 s in increments of 0.25 s	Scan rate for the user menu and for the lighting and settings menus. If user control is set to Sequence, the scan rate applies for the lighting and settings menus. **0**: Scanning in the menus is not possible.
Auto-repeat	On, Off	Automatic repeat function for the direction commands of various input devices. Auto-repeat means that sequential commands are issued when the input device is activated continuously. This is useful for navigation in the user menu.
Fwd/Rev Auto Toggle	On, Off	Method for changing direction in special controls with 3 directions or 3 switches. This parameter has no effect on other types of special controls. It is intended primarily for the use of head controls. • **On**: The Forward/Reverse direction command of the special control can be used to change the selected driving direction. This is done by executing and confirming the Forward/Reverse direction command within the time defined in the **Auto Toggle Time** parameter. This changes the previously selected driving direction. To drive in the new driving direction, the Forward/Reverse direction command must be executed again within the **Auto Toggle Time**. If the defined time passes without a Forward/Reverse direction command, the selected driving direction returns to the original setting. • **Off**: Briefly operating the input device (user switch) selects a new driving direction. A double-click with the input device changes the profile or mode. **INFORMATION:** The **Fwd/Rev Auto Toggle** function cannot be used when latched driving is required, since this causes a conflict with the logic of the user commands. When the parameter is set to **On** and latched driving has been activated in the programming, the error message "Invalid settings" is displayed.
Auto Toggle Time	0.5 s to 5 s in increments of 0.25 s	Time limit for the user to execute the Forward/Reverse direction command in order for the command to take effect.
Actuator Selection	SID, Switch	Setting that defines whether the adjustment functions are selected using commands with the special control (SID) or with the user switch.
Actuator Axes	Normal, Swap, Left/Right, Right/Left	Setting that defines what direction commands of the special control (SID) are used to select the available functions. This parameter does not apply when special controls with 1-button scan are used. • **Normal**: The SID commands Left and Right are used to select the available adjustment functions and the Forward/Reverse commands execute the selected function. • **Swap**: The Forward/Reverse SID commands are used to select the available adjustment functions and the Left and Right commands execute the selected function. • **Left/Right**: The SID command "Left" is used to select the available adjustment functions and the SID command "Right" executes the selected function. The execution direction is changed by briefly issuing the SID command "Right". • **Right/Left**: The SID command "Right" is used to select the available adjustment functions and the SID command "Left" executes the selected function. The execution direction is changed by briefly issuing the SID command "Left".

8.3.2.7.2 Adapting the user menu

The position of the menu items in the user menu on the LCD monitor is set using the programmable parameters Position 1 through Position 16.
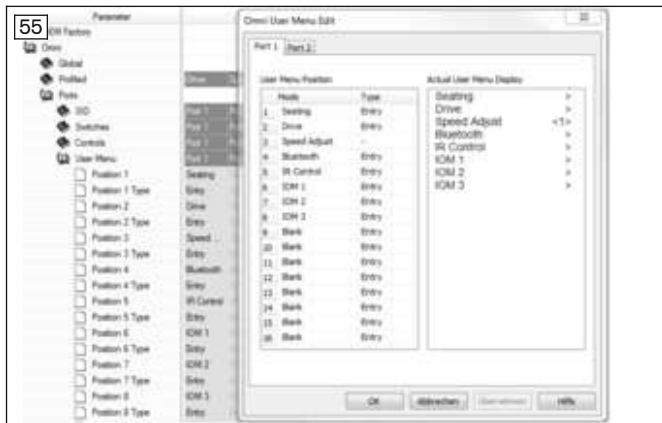
1) Under **Omni**, open the subfolder **Ports/User Menu**.

2) Double-clicking any entry in the column for the corresponding port (usually port 1) opens the **Omni User Menu Edit** window, illustrated to the left, where the individual positions and position types can then be edited by double-clicking.

3) There are 3 programmable options: Entry, List and Select. The effects of these options are shown in the following table:

Position 1	Position 1 type	Representation on LCD	Comment
Drive	Entry	Drive >	A switch movement to the right activates the **Drive** menu.
Drive	List	1: Profile 1 >\n2: Profile 2 >\n3: Profile 3 >	All available profiles for the mode are listed.
Drive	Select	Profile < 3 >	A new profile can be selected, but only takes effect after an additional operating action

8.3.2.7.3 User switch settings

The types of switches which are connected to the special control and how their operation is interpreted is configured under **Omni/Ports/Switches**.

Parameter	Setting range	Description
User Switch	Normally Open, Normally Closed	Setting for whether the TEN° LCD module expects a user switch as a normally open contact or a normally closed contact.
Switch Detect	On, Off, Limp	Behaviour of the TEN° LCD module when the connection to the user switch is interrupted:\n**On**: Driving mode is not available. This standard setting should be kept.\n**Off**: The TEN° LCD module attempts to maintain normal operation even though an input device is no longer connected.\n**Limp**: The TEN° LCD module permits driving mode, but at a reduced speed. Visible and audible warning signals are generated.
9-Way Detect	On, Off	Setting for whether the TEN° LCD module expects a "detection link" in a special control connected to the 9-pin D-Sub plug connection.\nOn: the TEN° LCD module expects a "detection link". If none is found, driving mode is not available.\nOff: no "detection link" is needed.
Switch Long	0.5 s to 5 s in increments of 0.25 s	Period of time that the user switch must be activated to put the TEN° LCD module in standby mode.\n**INFORMATION:** When using special controls with 1-button scan, the TEN° LCD module can be put into standby mode via the user menu or Sequence.
Switch Medium	0.5 s to 5 s in increments of 0.25 s	This parameter is intended only for 3-axis proportional special controls and special controls with a switch.

Parameter	Setting range	Description
		A change in direction occurs immediately when the input device (user switch) is operated, provided the Double Click parameter has been set to 0. When the input device is no longer operated and the Forward/Reverse command is issued, driving begins in the newly selected direction.
		When the input device continues to be operated and held for the time period set using the programmable parameter, this is interpreted as normal operation of the input device, which means that switching to the user menu or the other wheelchair functions follows in sequence. There is no switching of directions in this case.
		As with the other two methods, the TEN° LCD module switches to standby mode when the input device is operated longer than the time period set using the Switch Long programmable parameter.
Switch Debounce	30 ms to 500 ms in increments of 10 ms	Time period for continuous operation of the input device (user switch) before a new state is registered.
Double Click	0 to 2.5 s in increments of 0.1 s	Time period in which operation of the input device (user switch) must be detected twice to be recognised as a double-click.
		0: double-click function is not supported. This setting should be used when accidental double-clicks could cause problems.

8.3.2.7.4 Beeps

Beeps can be assigned to the individual operating processes of the special control under **Omni/Ports/Beeps**.

Parameter	Setting range	Description
Profile Change Mode Change User Menu Entry User Menu Scroll	Off, Short, Long	• Off: no beep • Short: short beep • Long: long beep
Profile Identifier Axis Identifier	On, Off	Setting of beeps corresponding to the number of the profile. These beeps have a somewhat lower tone than the beeps for Profile Change, Mode Change and so on.
Position 1 to Position 16	0 to 16 in single steps	Number of beeps that sound when the individual rows of the user menu are selected. Since the same menu item can appear on more than one row, the number of beeps is independent of the position number.

8.4 Joystick controls

The power wheelchair was equipped with one of the following joysticks for special control functions:

- **mo-Vis Micro joystick:** very small joystick, minimal force required (approx. 10 g), operated using e.g. fingers, chin (on the left in the illustration).
- **mo-Vis Multi joystick:** smaller joystick, limited force required (approx. 50 g), operated using e.g. fingers, chin (on the right in the illustration).

The power wheelchair was equipped with one of the following joysticks for special control functions:

- **mo-Vis Allround light joystick:** standard sized joystick, moderate force required (approx. 120 g, on the left in the illustration)
- **mo-Vis Allround joystick:** standard sized joystick, normal force required (approx. 250 g). Developed for comprehensive use, this joystick is suitable for most wheelchair users. It can be used as a standard joystick, chin-operated joystick or joystick for attendants (on the left in the illustration).
- **mo-Vis Heavy Duty joystick:** large joystick, very high force required (approx. 650 g). Operated by hand or foot. Developed for users who operate their joystick with a high level of force (on the right in the illustration).

Special features of the supplied joystick control include:
- Intuitive operation
- Simple menu navigation
- Individual settings for amplification
- Modular concept for individual adaptation
- Service-friendliness thanks to simple design
- Adjustment of speed, acceleration and deceleration values to the user's individual needs.

Detailed information regarding the technical data, configuration and assembly of the individual joysticks can be found in the respective user and installation handbook provided with the joystick.

8.4.1 Installation

8.4.1.1 Configuration example

INFORMATION
The special control has already been installed on the product. The following block diagram illustrates the installation situation.
For further installation information and configuration examples, please consult the instructions for use "R-Net special controls", reference number 647G1242.

Joystick control without TEN° LCD module

The illustration that follows shows a configuration example for a special control with a joystick directly on the R-Net bus.
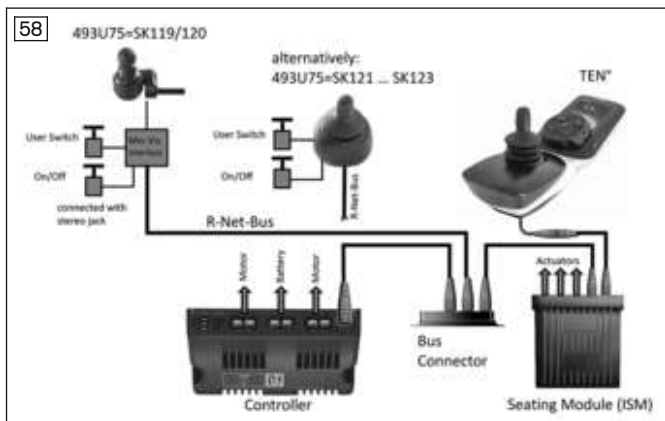
Joystick control with TEN° LCD module

The illustration that follows shows a configuration example for a special control with a joystick and TEN° LCD module including connection module.
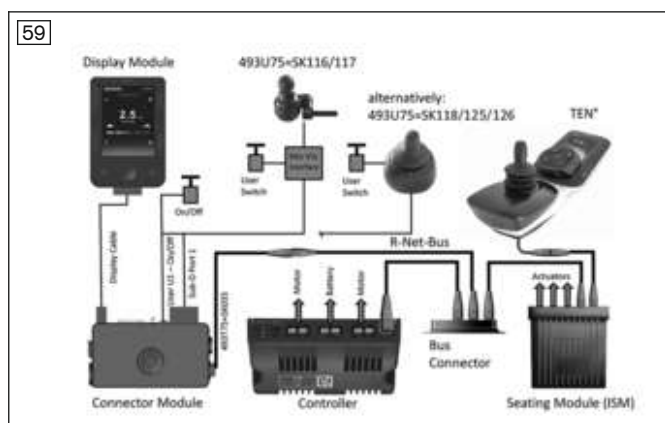
Note: If the special control has a swivel arm, the user switch and on/off switch functions are integrated into the satellite switch (see page 62).

Piko buttons or switches

> ⚠ **CAUTION**
>
> **Incorrect positioning of the emergency stop**
>
> Risk of injury due to unreachable user switch
>
> ► Position the user switch with the emergency stop function (switch or Piko button) in such a way that it is easy for the user to reach at any time, but is not pressed accidentally (through uncontrolled motions while driving).

The joystick control is normally combined with one or two freely positionable Piko buttons.

Alternatively, the joystick controller can be combined with one or two freely positionable switches. Ottobock offers the option of integrating the switches directly into the joystick recess (see page 49).

Variant with a Piko button/switch

Piko button 1 function ; switch 1 function	**Variant 1:** On/off switch for the control device; emergency stop function when pressed while driving **Variant 2:** Profile/mode switch; pressing it briefly (approx. 1 s) retrieves the available driving profiles and operating modes of the control system in succession (dependent on programming and connected devices); Only with programmed sequence mode: scrolling through the menu items
Joystick function*	In the driving profile (e.g. "Drive"): controls the speed and driving direction In "Seating" mode: adjusting the seat option; switching to the next seat option In an operating mode: navigating/operating the mode; scrolling through the menu items

Variant with two Piko buttons/switches

Piko button 1 function ; switch 1 function	On/off switch for the control device; emergency stop function when pressed while driving
Piko button 2 function ; switch 2 function	Profile/mode switch; pressing this button briefly (approx. 1 s) retrieves the available driving profiles and operating modes of the control system in succession (dependent on programming and connected devices)
Joystick function*	In the driving profile (e.g. "Drive"): controls the speed and driving direction In "Seating" mode: adjusting the seat option; switching to the next seat option In an operating mode (e.g. "Bluetooth Device" mode): navigating/operating the mode; scrolling through the menu items

* For more detailed information on the function of a joystick, see the instructions for use (user)

8.4.1.2 Installation on a tray
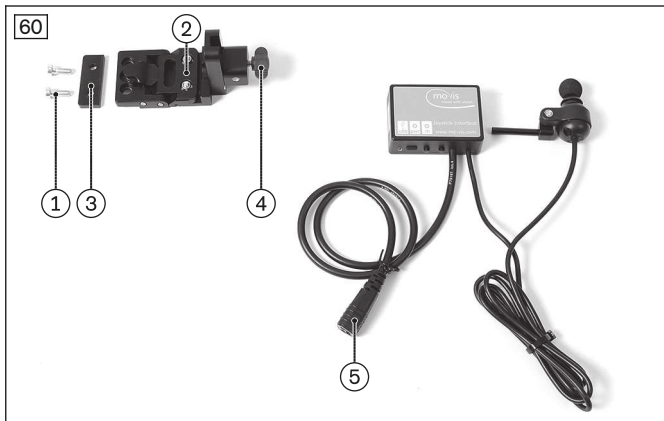
Installation is described using the mo-Vis Multi-joystick as an example, but also applies to the other compatible joystick types with a round rod.

Components for installing the joystick control on the tray (see fig. 60):

1. Fastening screws
2. Holder
3. Plate and compression spring
4. Thumb screw for the holder
5. Joystick with round rod 6 mm, mo-Vis connection module and connecting cables
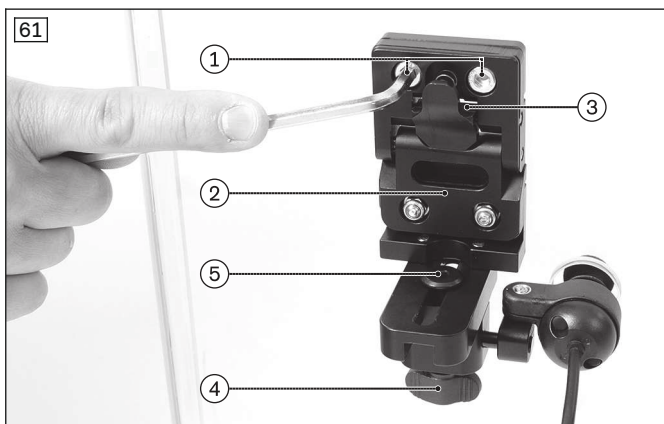
1) Drill the holes for the joystick and for the fastening screws in the tray (not illustrated).
   INFORMATION: Position the holes in the tray such that the user will be able to easily operate the joystick being installed.
2) Set the holder onto the tray from below (see fig. 61, item 2).
   INFORMATION: Insert the plate and compression spring between the holder and tray (see fig. 61, item 3).
3) Insert and hand-tighten the 2 screws between the holder and tray (see fig. 61, item 1).
4) Slide the joystick into the holder and firmly tighten all screws of the holder.
   INFORMATION: If necessary, fold the holder down first. Adjust the height of the joystick with the thumb screw (see fig. 61, item 4) and the centre position with the clamping screw, as needed (see fig. 61, item 5).
5) Attach the tray to the power wheelchair.
6) Attach the mo-Vis connection module under the seat.
7) Install and connect the cable according to the configuration example.
   INFORMATION: Make sure that cables cannot get stretched, pinched or caught when the wheelchair is operated.

8.4.1.3 Mechanical settings for joystick control (tray)

> **INFORMATION**
>
> When the joystick is installed, the arrow on the joystick should point straight ahead. The setting for the straight-ahead joystick direction can also be adjusted by programming the directional assignment: see page 50.

Subsection "Adjusting straight-ahead movement" of the following section contains more information on the correct orientation of the joystick.

8.4.1.4 Mechanical settings for joystick control (arm support)
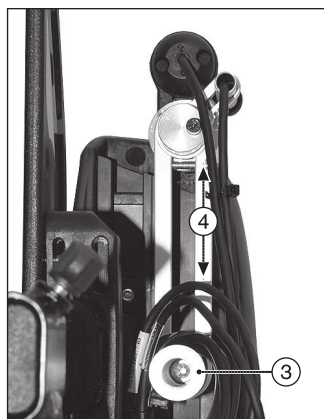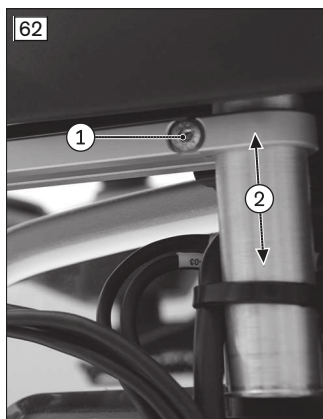
Adjusting the height/angle of the holding arm
1) Loosen the Allen head screw on the holding arm (see fig. 62, item 1).
2) Move the holding arm to the desired height (see fig. 62, item 2) and the desired angle (not pictured).
3) Retighten the Allen head screw.

Adjusting the holding arm to match the user's arm length
1) Loosen the Allen screw in the adaptation bushing (see fig. 62, item 3).
2) Slide the holding arm to the desired length (see fig. 62, item 4).
3) Retighten the Allen screw in the adaptation bushing.
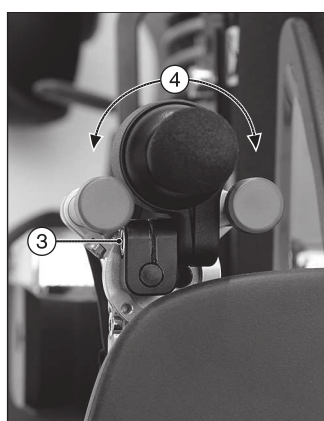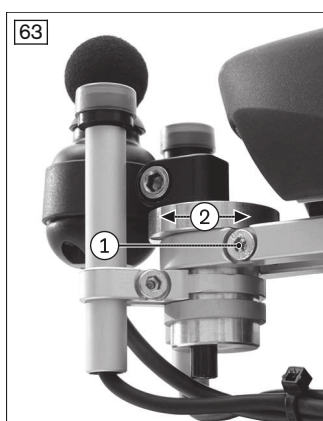
Adjusting the angle of the joystick position – variant 1
1) Loosen the Allen head screw on the holding arm (see fig. 63, item 1).
2) Rotate the joystick recess to the desired position (see fig. 63, item 2).
3) Retighten the Allen head screw.

Adjusting the angle of the joystick position – variant 2
1) Loosen the Allen head screw on the joystick (see fig. 63, item 3).
2) Rotate the joystick to the desired position (see fig. 63, item 4).
3) Retighten the Allen head screw.
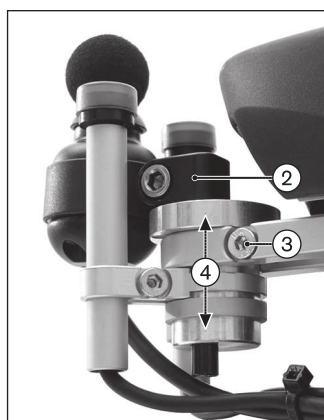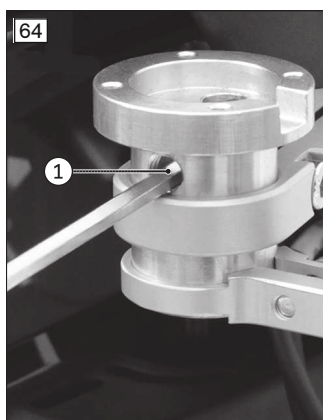
Adjusting the height of the joystick position – variant 1
1) **If necessary:** Remove the joystick from the holder. To do so, loosen the Allen head screw on the joystick (see fig. 63, item 3), pull the joystick upwards and remove it.
2) Loosen the Allen head screw on the joystick recess (see fig. 64, item 1).
3) Slide the joystick with the holding pin to the desired position (see fig. 64, item 2).
4) Retighten the Allen head screw.

Adjusting the height of the joystick position – variant 2
1) Loosen the Allen head screw on the holding arm (see fig. 64, item 3).
2) Slide the entire joystick recess to the desired height (see fig. 64, item 4).
3) Retighten the Allen head screw.
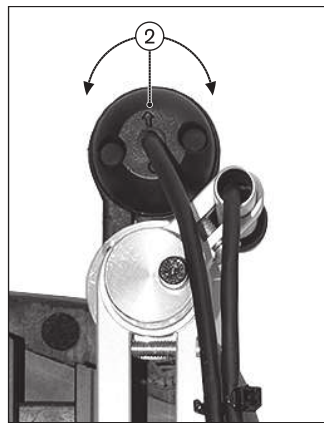
Adjusting straight-ahead movement

1) Loosen the Allen head screw on the holding arm of the joystick (see fig. 65, item 1).
2) Rotate the arrow on the joystick to the straight-ahead direction (see fig. 65, item 2).
3) Retighten the Allen head screw on the holding arm of the joystick.
   INFORMATION: The fine adjustment of the joystick for straight-ahead movement can be subsequently adapted by programming the directional assignment: see page 50.
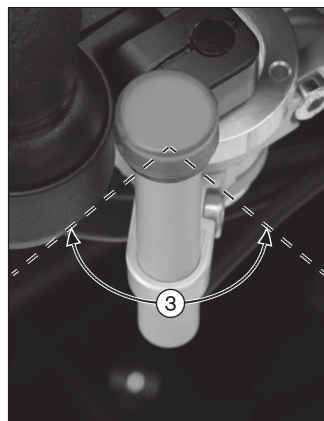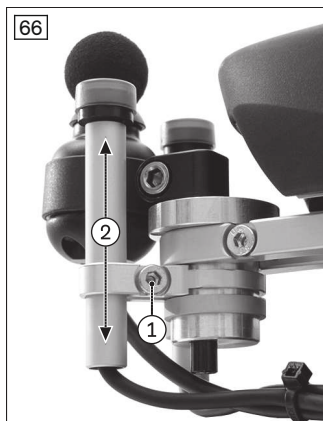
Adjusting the height of a button

1) **CAUTION! The button serves as an emergency stop. It must be positioned on the power wheelchair in such a manner that it can be easily accessed by the user at all times.**
   Loosen the Allen head screw on the button (see fig. 66, item 1).
2) Slide the button to the desired height (see fig. 66, item 2).
3) Retighten the Allen head screw.

Adjusting the angle of a button

1) **CAUTION! The button serves as an emergency stop. It must be positioned on the power wheelchair in such a manner that it can be easily accessed by the user at all times.**
   Loosen the Allen head screw on the button (see fig. 66, item 1).
2) Move the button to the desired angle (see fig. 66, item 3).
3) Retighten the Allen head screw.

8.4.2 Programming

8.4.2.1 Joystick settings

The following parameters can be set under **Controls/Joystick** (see illustration on the left):

Parameters	Adjustment range	Description
Joystick Forward Throw (Joystick Forward Throw)	25% to 100% in single steps	Used to set how far forwards the joystick must be moved before full forward speed is reached. This is particularly useful for users who do not have full movement of their hands.

Parameters	Adjustment range	Description
		The percentage corresponds to the joystick movement required to reach full forward speed. If it is set to 50 %, for example, the joystick only needs to be moved halfway to reach full speed.
		Forward throw can also be set interactively, i.e. with the user moving the joystick (please see information following the table for details).
Joystick Backward Throw (Joystick Backward Throw)	25 % to 100 % in single steps	Used to set how far backwards the joystick must be moved before full reverse speed is reached. This is particularly useful for users who do not have full movement of their hands.
		The percentage corresponds to the joystick movement required to reach full reverse speed. If it is set to 50 %, for example, the joystick only needs to be moved halfway to reach full speed.
		Backward throw can also be set interactively, i.e. with the user moving the joystick (please see information following the table for details).
Joystick Left Throw (Joystick Left Throw)	25 % to 100 % in single steps	Used to set how far the joystick must be moved to the left before full turning speed to the left is reached. This is particularly useful for users who do not have full movement of their hands.
		The percentage corresponds to the joystick movement required to reach full turning speed towards the left. If it is set to 50 %, for example, the joystick only needs to be moved halfway to reach full turning speed.
		Left throw can also be set interactively, i.e. with the user moving the joystick (please see information following the table for details).
Joystick Right Throw (Joystick Right Throw)	25 % to 100 % in single steps	Used to set how far the joystick must be moved to the right before full turning speed to the right is reached. This is particularly useful for users who do not have full movement of their hands.
		The percentage corresponds to the joystick movement required to reach full turning speed towards the right. If it is set to 50 %, for example, the joystick only needs to be moved halfway to reach full turning speed.
		Right throw can also be set interactively, i.e., with the user moving the joystick (please see information following the table for details).
Joystick Deadband (Joystick Deadband)	10 % to 50 % in single steps	Used to set the size of the neutral area of the joystick. In other words, how far the joystick must be moved before the brakes are released and driving begins. The normal setting is 10 %.
Invert Fwd Rev JS Axis Invert Left Right JS Axis Swap Joystick Axis (Invert Left Right JS Axis, Invert Fwd Rev JS Axis, Swap Joystick Axis)	Yes, no	These three parameters are described in a single section as they are closely linked. Eight different configurations for the joystick direction or orientations are possible using the parameters. For example, it may be necessary to have to move the joystick backwards in order to drive forwards. In this case, **Invert Fwd Rev JS Axis** can simply be set to **Yes**. However, there are many other combinations which are best explained in the form of a table (see below for details).

Interactive setting of the joystick throw

Interactive setting of the joystick throw can only be carried out via on-board programming (OBP).

Invert Fwd Rev JS Axis, Invert Left Right JS Axis, Swap Joystick Axis

Required orientation				Required programming		
Forward	Reverse	Left	Right	Invert F/R	Invert L/R	Swap axis
Forward	Reverse	Left	Right	No	No	No
Reverse	Forward	Left	Right	Yes	No	No
Forward	Reverse	Right	Left	No	Yes	No
Reverse	Forward	Right	Left	Yes	Yes	No

Required orientation				Required programming		
Forward	Reverse	Left	Right	Invert F/R	Invert L/R	Swap axis
Left	Right	Reverse	Forward	No	No	Yes
Left	Right	Forward	Reverse	Yes	No	Yes
Right	Left	Reverse	Forward	No	Yes	Yes
Right	Left	Forward	Reverse	Yes	Yes	Yes

8.4.2.2 Calibration

Joystick deflection can be individually adapted to the respective movement capacity of the user. This calibration can be carried out once and modified as required.

> **Prerequisite:** On-board programming mode is activated (see page 36).

1) Select **Omni > System > Joystick > Calibrate**.

2) The procedure is carried out automatically. Follow the instructions on the LCD monitor. Values for forward/reverse and left/right axes are displayed. A symbol appears next to each value (X or checkmark):
   X: the axis value is outside the permitted calibration range for this direction
   Checkmark: the axis value is within the permitted calibration range for this direction.

3) Deflect the joystick in the corresponding direction until both values are in the permitted range. Repeat for all 4 directions.

4) The LCD monitor shows when the calibration has been completed successfully. The display then returns to the system menu.

> **INFORMATION**
>
> The calibration may be lost if there is a drop in voltage or the battery capacity is low.

8.4.2.3 Configuring latched drive mode

The following parameters can be set under **Latched**:

Parameter	Setting range	Description
Latched Drive	Off, Step, Step reverse, Cruise, Cruise reverse	Type of latched drive mode: • **Off**: Latched drive mode is switched off. • **Step**: Step mode in the forward direction only. Driving in step mode means that the latched speed of the wheelchair is increased or decreased using short joystick movements. • **Step reverse**: Step mode in both the forward and reverse direction. • **Cruise**: Cruise mode in the forward direction only. Joystick movement accelerates the wheelchair and driving continues at the speed reached when the joystick is released. • **Cruise reverse**: Cruise mode in both the forward and reverse direction. If **Latched Drive** is set in a profile, an emergency stop switch should be connected to the socket for the external input device on the joystick module for the profile.
Latched Actuators	Yes, no	Operation of seat functions in latched mode, i.e. the seat function is triggered with a short joystick movement. A brief movement in the opposite direction stops the actuator. If **Latched Actuators** is set in a profile, an emergency stop switch should be connected to the socket for the external input device on the joystick module for the profile.
Latched Timeout	0 to 250 s in single steps	Timeout for driving and operation of the variable motors in latched mode. The timeout period is the maximum period of time for which the joystick can remain in the neutral position before movement in latched mode is ended. If the period of time is exceeded, movement in latched mode stops. Timeout is therefore an important safety function with which driving or movement of a variable motor is stopped when the user is unable to stop the functions as usual. It is important that the correct duration is set for the timeout.

Parameter	Setting range	Description
		When a value of 2 or lower is set, the timeout function is disabled. This should only take place in exceptional cases and following a comprehensive risk analysis.
Latched Timeout Beep	Yes, no	A beep is emitted shortly before expiration of the timeout period.

8.5 Push-button controls

The push-button control has 1 button (scan function, also called scan-light control).

All functions including the driving function can be controlled using this button (exception: Bluetooth functions). The system automatically moves through the driving directions display and the menu display at a configurable speed. Pressing the button implements the currently displayed driving direction or function.

The push-button control has 3 buttons.

These buttons are used with the following functions:

- Forward/reverse
- Right
- Left

The push-button control has 4 buttons.

These buttons are used with the following functions:

- Forward
- Reverse
- Right
- Left

8.5.1 1-button control (scan function)

8.5.1.1 Installation

INFORMATION

The user switch serves as an EMERGENCY STOP. It must be positioned on the wheelchair in such a manner that it can be easily accessed by the user at all times.

With 1-button control, one switch is required to drive the wheelchair and to operate all of the functions.

Switches may include, for example:

- Button with gooseneck
- Piko button
- Other suitable switches.

8.5.1.1.1 Configuration example

INFORMATION

The special control has already been installed on the product. The following block diagram illustrates the installation situation.

For further installation information and configuration examples, please consult the instructions for use "R-Net special controls", reference number 647G1242.

The 1-button control is operated using the user switch. It is connected to the U1 jack on the connection module with a jack plug (see page 35).
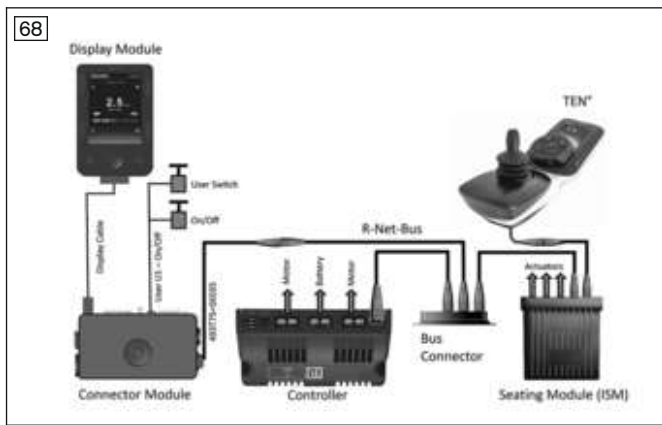
8.5.1.1.2 Mechanical settings

The button with gooseneck has a flexible tube. This makes it possible to easily adjust the device to meet the individual needs of the user. Bend the flexible tube as required and position the button precisely.

The piko button is fastened to the armrest or at some other suitable point on the wheelchair using a hook-and-loop strap. Its position can be individually determined by the wheelchair user.

8.5.1.2 Programming

The following parameters for the 1-button control can be set via the R-Net programming interface:

Scan rate

The scan rate is set under **Omni/Global**.

Parameter	Setting range	Description
Scan Speed	0 s to 10 s in increments of 0.25 s.	The scan rate defines the time that the directional indicator remains in one position.

The settings for latched driving mode are described in the section that follows.

8.5.1.2.1 Configuring latched drive mode

The following parameters can be set under **Latched**:

Parameter	Setting range	Description
Latched Drive	Off, Step, Step reverse, Cruise, Cruise reverse	Type of latched drive mode: • **Off**: Latched drive mode is switched off. • **Step**: Step mode in the forward direction only. Driving in Step mode means that the latched speed is increased (when the arrow shown on the LCD module is pointing in the direction of travel) or reduced (when the arrow is pointing in the opposite direction) by briefly pressing the button. • **Step reverse**: Step mode in both the forward and reverse direction. • **Cruise**: Cannot be used with 1-button control. • **Cruise reverse**: Cannot be used with 1-button control.
Latched Actuators	Yes, no	Operation of seat functions in latched mode, i.e. the seat function is triggered by briefly pressing the button.
Latched Timeout	0 to 250 s in single steps	Timeout for driving and operation of the variable motors in latched mode. The timeout period is the maximum period of time for which the button can go without being pushed before movement in latched mode is ended. If the period of time is exceeded, movement in latched mode stops. Timeout is therefore an important safety function with which driving or movement of a variable motor is stopped when the user is unable to stop the functions as usual. It is important that the correct duration is set for the timeout.

Parameter	Setting range	Description
		When a value of 2 or lower is set, the timeout function is disabled. This should only take place in exceptional cases and following a comprehensive risk analysis.
Latched Timeout Beep	Yes, no	A beep is emitted shortly before expiration of the timeout period.

The following switch-specific parameters should also be noted for latched driving mode (see page 44):

• User Switch

• Switch Detect

• Switch Medium: specifies the maximum time for which the button may be pressed in order to execute the desired function. If the button is pressed longer than the specified time, this is interpreted as an emergency stop.

8.5.2 3 and 4-button control

8.5.2.1 Installation

8.5.2.1.1 Configuration example

> INFORMATION
>
> The special control has already been installed on the product. The following block diagram illustrates the installation situation.
>
> For further installation information and configuration examples, please consult the instructions for use "R-Net special controls", reference number 647G1242.

4-button control with TEN° LCD module

The 493U36=SK095 adapter is used to connect the 4 direction buttons. An external on/off switch on the on/off jack and the user switch on the U1 jack are connected in addition on the connection module of the TEN° LCD module (see page 35).
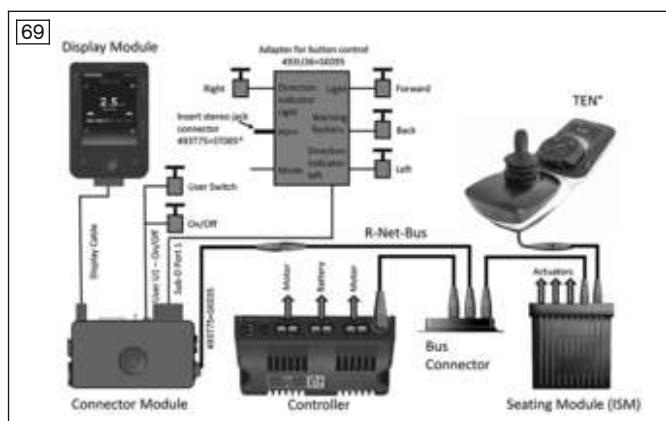
* If switch detect is not used, please change the configuration using the programming software: Switch detect off.

4-button control with input/output module (IOM)

The 493U36=SK095 adapter is used to connect the 4 direction buttons. The external on/off switch is also connected to the input/output module (IOM).
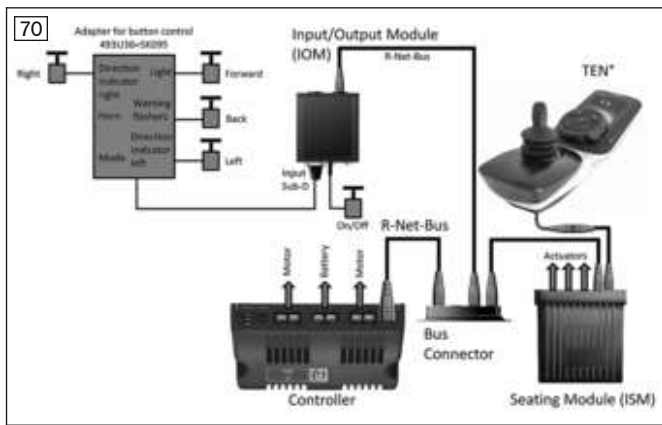
3-button control with TEN° LCD module

By using the above arrangement, a 3-button control can be realised as well by eliminating the [Back] button and configuring the [Forward] button with a double "Forward/Back" assignment.

8.5.2.1.2 Installing push-button control
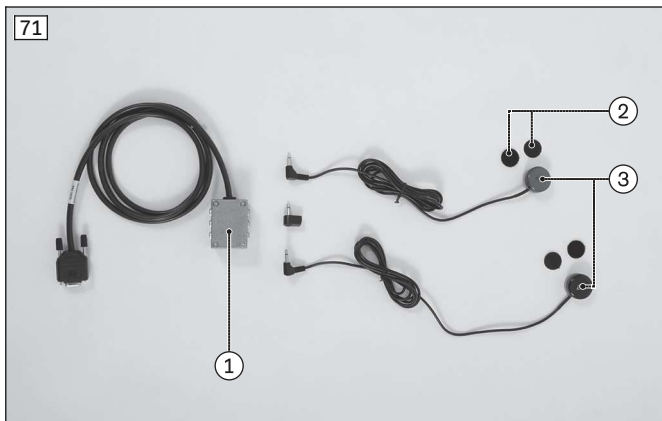
The buttons can be positioned on the wheelchair as desired using the supplied hook-and-loop pads. Mount the button adapter under the seat using e.g. hook and loop cable ties. Secure the cables on the wheelchair with hook-and-loop cable ties or cable clips.

1. Button adapter
2. Hook-and-loop pads
3. Buttons

8.5.2.2 Programming

With the 4-button control, driving is carried out using the buttons for the Forward, Reverse, Right and Left directions. With the 3-button control, one button is used for both forward and reverse driving. A user switch is used with both types in addition.

The following parameters are relevant for the 3 and 4-button control:

Orientation

The assignment of the individual buttons (Forward/Reverse, Left/Right) can be changed under **Controls/Joystick**.

Parameter	Setting range	Description
Invert Left Right JS Axis Invert Fwd Rev JS Axis Swap Joystick Axis	Yes, No	These three parameters are described in a single section as they are closely linked. Eight different configurations for the direction or orientations are possible using the parameters. For example, it may be necessary to have to press the button on the "Reverse" connection in order to drive forwards. In this case, **Invert Fwd Rev JS Axis** can simply be set to **Yes**. However, there are many other combinations which are best explained in the form of a table (see below for details).

Required orientation				Required programming		
Forward	Reverse	Left	Right	Invert F/R	Invert L/R	Swap axis
Forward	Reverse	Left	Right	No	No	No
Reverse	Forward	Left	Right	Yes	No	No
Forward	Reverse	Right	Left	No	Yes	No
Reverse	Forward	Right	Left	Yes	Yes	No

Required orientation				Required programming		
Forward	Reverse	Left	Right	Invert F/R	Invert L/R	Swap axis
Left	Right	Reverse	Forward	No	No	Yes
Left	Right	Forward	Reverse	Yes	No	Yes
Right	Left	Reverse	Forward	No	Yes	Yes
Right	Left	Forward	Reverse	Yes	Yes	Yes

Seat

The assignment of the operating functions for the seat settings to the buttons can be changed. The "Forward" and "Reverse" buttons are used for seat adjustment (e.g. up, down) by default, while the "Right" and "Left" buttons are used to select the desired seat function.

The settings can be changed under **Omni/Ports/Controls**.

Parameter	Setting range	Description
Actuator Selection	SID, Switch	Setting that defines whether the adjustment functions are selected using special control (SID) commands or with the input device (user switch).
Actuator Axes	Normal, Swap, Left/Right, Right/Left	Setting that defines which direction commands of the special control (SID) are used to select the available functions. This parameter does not apply when special controls with 1-button scan are used. • **Normal**: The SID commands Left and Right are used to select the available adjustment functions and the Forward/Reverse commands execute the selected function. • **Swap**: The Forward/Reverse SID commands are used to select the available adjustment functions and the Left and Right commands execute the selected function. • **Left/Right**: The SID command "Left" is used to select the available adjustment functions and the SID command "Right" executes the selected function. The execution direction is changed by briefly issuing the SID command "Right". • **Right/Left**: The SID command "Right" is used to select the available adjustment functions and the SID command "Left" executes the selected function. The execution direction is changed by briefly issuing the SID command "Left".

Special features of the 3-button control

With the 3-button control, the same button is used for both forward and reverse driving. The setting is configured under **Omni/Ports/Controls** using the following parameters:

Parameter	Setting range	Description
Fwd/Rev Auto Toggle	On, Off	Method for changing direction in special controls with 3 directions or 3 switches. This parameter has no effect on other types of special controls. It is intended primarily for the use of head controls. • **On**: The Forward/Reverse direction command of the special control can be used to change the selected driving direction. This is done by executing and confirming the Forward/Reverse direction command within the time defined in the **Auto Toggle Time** parameter. This changes the previously selected driving direction. To drive in the new driving direction, the Forward/Reverse direction command must be executed again within the **Auto Toggle Time**. If the defined time passes without a Forward/Reverse direction command, the selected driving direction returns to the original setting. • **Off**: Briefly operating the input device (user switch) selects a new driving direction. A double-click with the input device changes the profile or mode. **INFORMATION:** The **Fwd/Rev Auto Toggle** function cannot be used when latched driving is required, since this causes a conflict with the logic of the user commands. If the parameter is set to **On**

Parameter	Setting range	Description
		and latched driving has been activated in the programming, the "Invalid settings" error message is displayed.
Auto Toggle Time	0.5 s to 5 s in increments of 0.25 s	Time limit for the user to execute the Forward/Reverse direction command in order for the command to take effect.

8.6 Sip and puff control

8.6.1 Installation

8.6.1.1 Configuration example

> **INFORMATION**
>
> The special control has already been installed on the product. The following block diagram illustrates the installation situation.
>
> For further installation information and configuration examples, please consult the instructions for use "R-Net special controls", reference number 647G1242.

The illustration shows a configuration example for a sip and puff control. In addition to the sip and puff unit, a suitable user switch and an external on/off switch can be connected to the connection module of the LCD monitor.
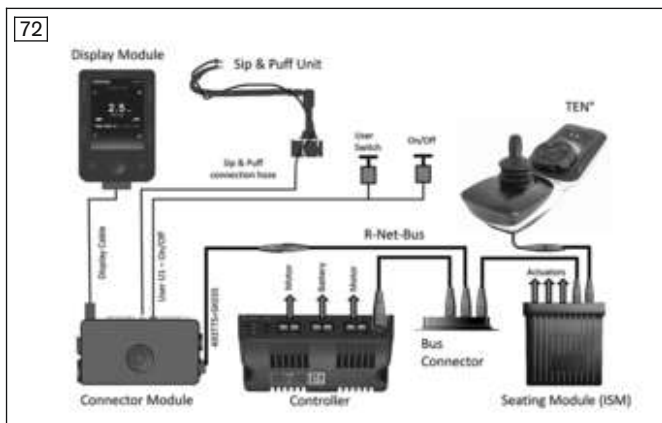
8.6.1.2 Mechanical settings for the sip and puff control

The mouthpiece holder and the holder for the user switch both have flexible tubes. This makes it possible to easily adjust the device to meet the individual needs of the user. Bend the flexible tube as required and precisely position the user switch and the mouthpiece holder.

Mechanical settings on the standard seat and VAS seat

Adjustment options on the sip and puff unit:

1. 2 set screws
2. Adjustment ring to set the vertical stop
3. Allen head screw
4. Gooseneck
5. Allen head screw
6. Locking lever
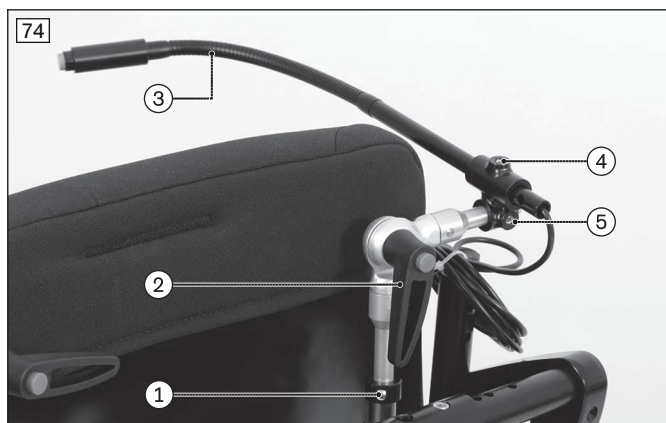
Adjustment options on the user switch unit:
1. Adjustment ring to set the vertical stop
2. Locking lever
3. Gooseneck
4. Allen head screw
5. Allen head screw

Mechanical settings on the Recaro seat
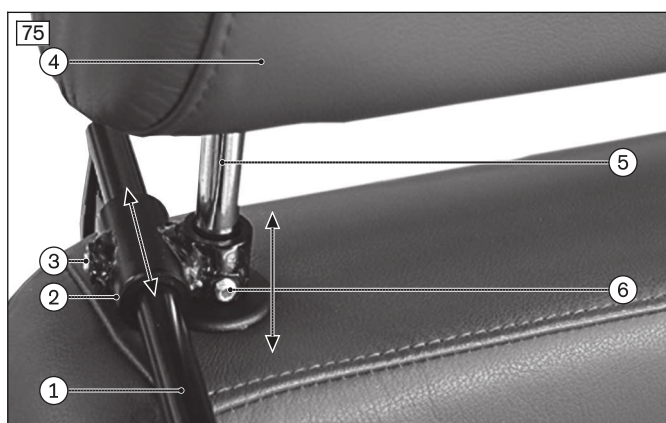
1. Gooseneck
2. Clamp
3. Set screw
4. Headrest
5. Headrest strut
6. Set screw

Adjusting the height using the clamp on the headrest strut
1) Loosen the set screw on the clamp guide of the headrest strut.
2) Slide the clamp on the holder up along the headrest strut.
3) Retighten the set screw.

Adjusting the length via the clamp on the holder
1) Loosen the set screw on the clamp guide of the holder.
2) Slide the holder in the clamp forwards or backwards.
3) Retighten the set screw.

8.6.1.3 Electrical connection of the sip and puff control
1) Connect the 3.5 mm (1/8") diameter hose, equipped with a mouthpiece, to the connection module of the TEN° LCD module (for the connections on the connection module: see page 35).
2) Connect the bus cable of the connection module to a free bus slot in the control device.
3) Connect the jack plug of the user switch to the connection module of the TEN° LCD module.

8.6.2 Programming
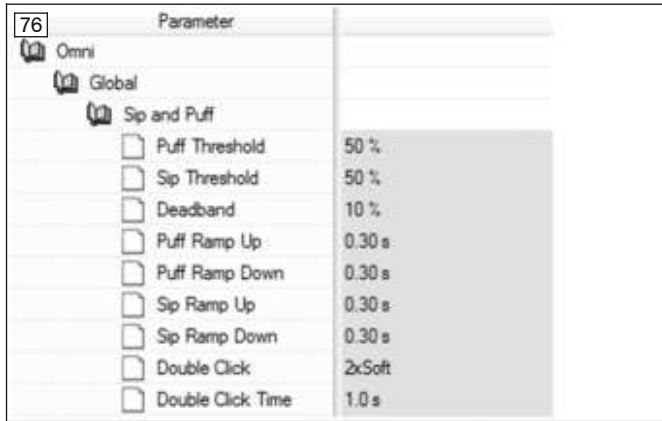
The following parameters can be set under **Omni/Global/Sip and Puff** (see illustration on the left):

Parameter	Setting range	Description
Puff Threshold (Puff Threshold)	**Deadband** value up to 100 in single steps	Threshold between soft and hard puffing. **INFORMATION:** This value is set through calibration (see page 61) and should not be changed.
Sip Threshold (Sip Threshold)	**Deadband** value up to 100 in single steps	Threshold between soft and hard sipping. **INFORMATION:** This value is set through calibration (see page 61) and should not be changed.
Deadband (Deadband)	5 to 50 in single steps	Extent of the neutral range for sipping/puffing. Here you can set the amount of pressure the user needs to apply by sipping or puffing before the wheel lock of the power wheelchair is released and it starts driving.
Puff Ramp Up (Puff Ramp Up)	0 ms to 2000 ms in increments of 50 ms	Time for the increase from zero pressure to hard puffing. When hard puffing starts, the air pressure is briefly below the threshold for hard puffing. This could be interpreted as a command for soft puffing by the TEN° LCD module. The time required to generate sufficient pressure to cross this threshold varies from user to user. If this threshold is not reached within the time set here, this is interpreted as soft puffing, provided the pressure is above the set deadband value.
Puff Ramp Down (Puff Ramp Down)	0 ms to 2000 ms in increments of 50 ms	Time for the drop from hard puffing to zero pressure. When hard puffing ends, the air pressure remains below the puff threshold but still above the deadband value for a certain time. This could be interpreted as a command for soft puffing by the TEN° LCD module. With this parameter, the user has enough time to reach the deadband without unintentionally executing soft puffing. If the deadband is not reached within the time configured here, this is interpreted as soft puffing, provided the pressure is below the puff threshold.
Sip Ramp Up (Sip Ramp Up)	0 ms to 2000 ms in increments of 50 ms	Time for the increase from zero pressure to hard sipping. When hard sipping starts, the air pressure is briefly below the threshold for hard sipping. This could be interpreted as a command for soft sipping by the TEN° LCD module. The time required to generate sufficient pressure to cross this threshold varies from user to user. With this parameter, the user has more time to reach the threshold for hard sipping. If this threshold is not reached within the time set here, this is interpreted as soft sipping, provided the pressure is above the configured deadband value.
Sip Ramp Down (Sip Ramp Down)	0 ms to 2000 ms in increments of 50 ms	Time for the drop from hard sipping to zero pressure. When hard sipping ends, the air pressure remains below the threshold for hard sipping but still above the deadband value for a certain time. This could be interpreted as a command for soft sipping by the TEN° LCD module. With **Sip Ramp Down**, the user

Parameter	Setting range	Description
		has enough time to reach the deadband without unintentionally executing soft sipping. If the deadband is not reached within the time set here, this is interpreted as soft sipping, provided the pressure is below the sipping threshold.
Double Click (Double Click)	2 commands soft; 2 commands hard	Two pneumatic processes carried out within the time set in the **Double Click Time** parameter represent short operation of the input device in standby mode. This parameter configures whether a soft or hard double command is required.
Double Click Time	0 s to 2.5 s in increments of 0.1 s	Time within which two pneumatic commands have to be detected in order to be recognised as a double-click. If the parameter is set to 0, the double-click function is not supported.

8.6.3 Calibration

Calibration adapts the sip and puff control to the individual abilities of the user.

Deadband

Threshold Maker
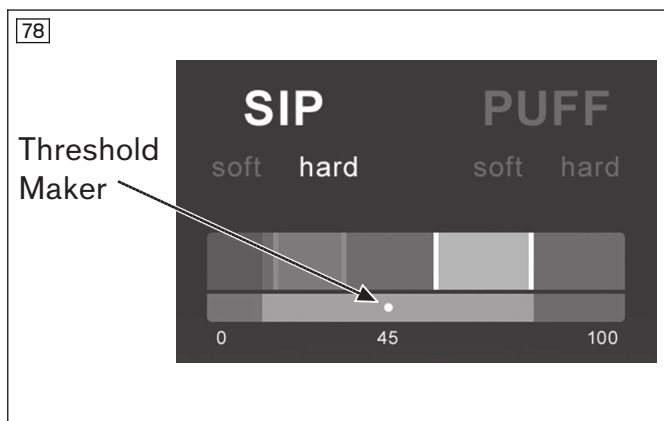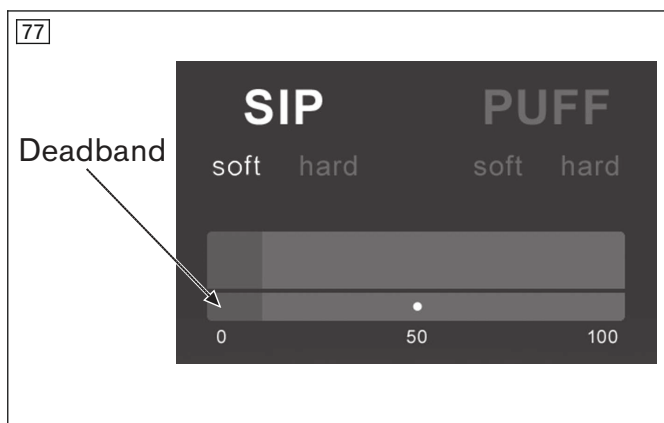
> **Prerequisite:** The on-board programming device is switched on (see page 36).

1) Select **Omni > Global > Sip and Puff > Calibrate**. The illustration shows what is displayed on the LCD monitor (see fig. 77). **Sip Soft** is highlighted initially.

2) Now have the user sip softly several times in a row. After each sipping process, the generated sip pressure is shown on the LCD monitor on a scale of 0 to 100.
   → Repeated sipping processes generate a "band" of values. It may be better for the user not to look at the monitor while sipping in order to prevent attempts at reaching previous values.

3) Once you have ascertained that the user is able to reliably repeat the soft sipping processes within the band, press the right-hand navigation button on the LCD monitor to continue and select **Sip Hard**.

4) Now have the user execute a series of hard sipping processes, once again generating a "band" of values. The pressure difference between soft and hard sipping should ideally be as great as possible.

5) Move the threshold marker (see fig. 78) to the middle between the end of the **Sip Soft** band and the start of the **Sip Hard** band. This is done with the + and - buttons on the LCD monitor.

6) Once you have ascertained that the user is able to reliably repeat the hard sipping processes within the band, press the right-hand navigation button on the LCD monitor to continue and select **Puff Soft**.

7) Repeat the process described above for Puff Soft and Puff Hard, including setting the threshold marker.

8) When each calibration step is complete, use the right-hand navigation button on the LCD monitor to continue.

INFORMATION
Please note that all of these values have to be greater than the value set in the **Deadband** parameter (see page) in order to carry out the calibration successfully.

8.7 Swivel arm

The swivel arm offers the option of power-swiveling the special control elements to a passive position for getting in and out as well as to an active position for controlling the wheelchair.

The following element can be used to operate the swivel arm:

Article number	Designation
493T75=RK161	Satellite switch for on/off and swivel function (right mounted)
493T75=LK161	Satellite switch for on/off and swivel function (left mounted)

8.7.1 Installation

8.7.1.1 Configuration example

> **INFORMATION**
>
> The special control has already been installed on the product. The following block diagram illustrates the installation situation.
>
> For further installation information and configuration examples, please consult the instructions for use "R-Net special controls", reference number 647G1242.

The swivel arm can be used e.g for joystick controls, push-button controls or sip and puff controls. When the swivel arm is used, the satellite switch also fulfils the functions of the user switch and the external on/off switch. The other joysticks which are compatible with the joystick control (see page 45) can also be used instead of the 493U75=SK116/117 joystick.

Swivel arm with TEN° LCD module

The illustration that follows shows a configuration example for a special control with a swivel arm, joystick, satellite switch and TEN° LCD module including connection module.
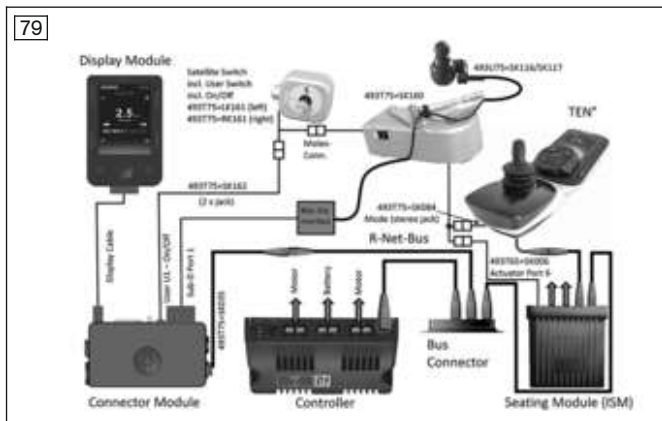
Swivel arm without TEN° LCD module

The illustration that follows shows a configuration example for a special control with a swivel arm, joystick and satellite switch, with direct connection to the R-Net bus.
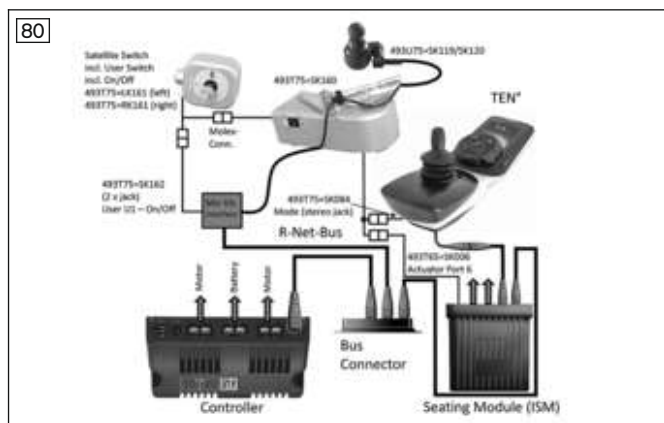
8.7.1.2 Mechanical settings for the swivel arm

> **INFORMATION**
>
> The satellite switch serves as an EMERGENCY STOP. It must be positioned on the wheelchair in such a manner that it can be easily accessed by the user at all times.

Adjusting the length using the telescopic guides of the arms
1) Loosen the set screws (next illustration, item 2, 4, 6) on the telescopic guide and set the desired length.
2) Tighten the set screws again.

Adjusting the angle of the joystick
1) Loosen the set screw securing the joystick (next illustration, item 1) on the end of the arm.
2) Turn the joystick to the desired position.
3) Retighten the set screw.

Adjusting the angle via the screw connection on the swivel arm
1) Loosen the socket fillister-head screw at the joint (next illustration, item 3).
2) Set the desired angle and retighten the socket fillister-head screw.
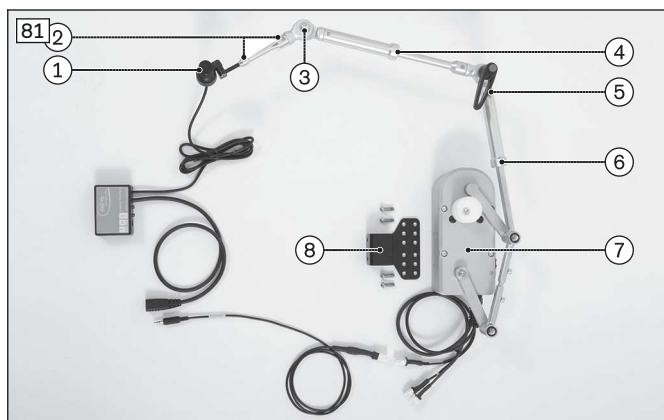
Adjusting the angle and length on the swivel arm:
1. Joystick
2. Set screws
3. Joint with socket fillister-head screw
4. Set screw
5. Locking lever
6. Set screw
7. Swivel unit
8. Holding plate

Adjusting the angle via the locking lever
1) Release the locking lever (see next illustration, item 4).
2) Set the desired angle.
3) Fix this angle with the locking lever.
4) Pull out the handle of the locking lever, turn it to the desired position and allow it to latch back into place.

Adjusting the angle of the satellite switch
1) Loosen the set screw (next illustration, item 7) in the telescopic guide.
2) Turn the satellite switch to the desired position.
3) Retighten the set screw.
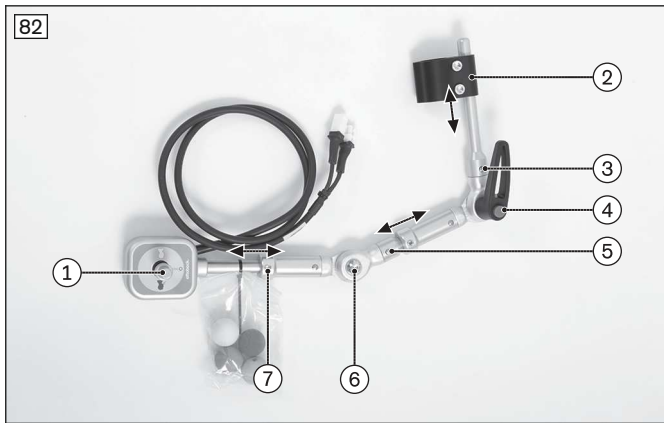
Adjusting the angle and length on the satellite switch:

1. Satellite switch
2. Clamp for attachment to the back tube
3. Set screw
4. Locking lever
5. Set screw
6. Joint with socket fillister-head screw
7. Set screw

Article number	Designation
493T75=RK161	Satellite switch, pre-assembled, right
493T75=LK161	Satellite switch, pre-assembled, left

Sliding the holding plate laterally (only in conjunction with installation on Recaro seat)

1) Loosen the two cap nuts on the holding plate.
2) Slide the holding plate along the slotted holes to the desired position.
3) Refasten the holding plate with Allen screws and cap nuts.
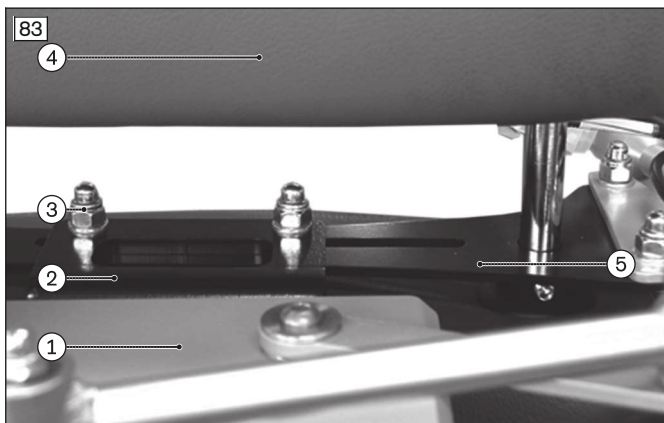
Sliding the holding plate laterally:

1. Swivel unit
2. Swivel unit angle bracket
3. Cap nut
4. Headrest
5. Holding plate

8.8 Wireless environmental control

> **NOTICE**
>
> **Use of devices with electromagnetic emissions**
>
> Restriction of function due to electromagnetic fields
>
> ► The performance of the product can be affected by electromagnetic fields (highly radiating devices such as amateur radio or superimposed frequencies). If necessary, switch such devices off while using this product.

> **INFORMATION**
>
> The control device offers additional environmental control functions by default:
>
> ► The integrated Bluetooth function supports the wireless operation of PCs, smartphones/tablets (Android 4.0 or higher) and iOS devices (iPhone, iPad) directly from the control panel. Further information: see page 28.
> ► The integrated IR function makes it possible to control a wide range of different infrared devices. Further information: see page 29.
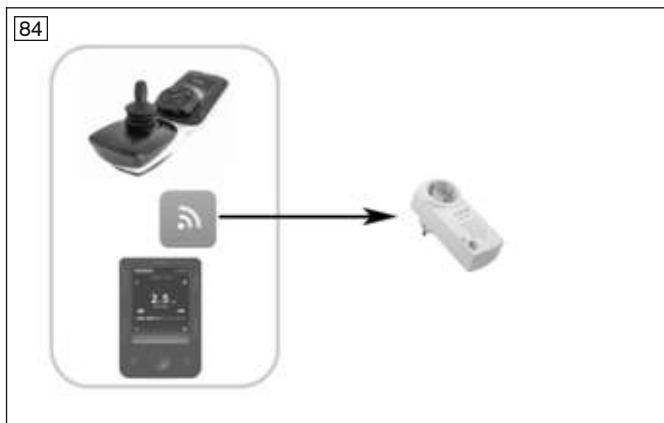
An additionally available wireless module makes it possible to control up to 6 building services receivers (e.g. outlets, light switches, roller shutters, etc.) wirelessly via the TEN° control panel or TEN° LCD module.

The wireless module is a transmitter (frequency 868.30 MHz), which uses the Easywave protocol especially developed for building services. This protocol is used in numerous building services products available in the market.

The maximum tested driving distance range is **20 m**.

8.8.1 Cables

> **INFORMATION**
>
> The special control has already been installed on the product. The following block diagram illustrates the installation situation.
>
> For further installation information and configuration examples, please consult the instructions for use "R-Net special controls", reference number 647G1242.

Environmental control with TEN° LCD module

The illustration that follows shows a wiring example for a wireless module in combination with an input/output module (IOM) and an integrated TEN° LCD module including connection module.
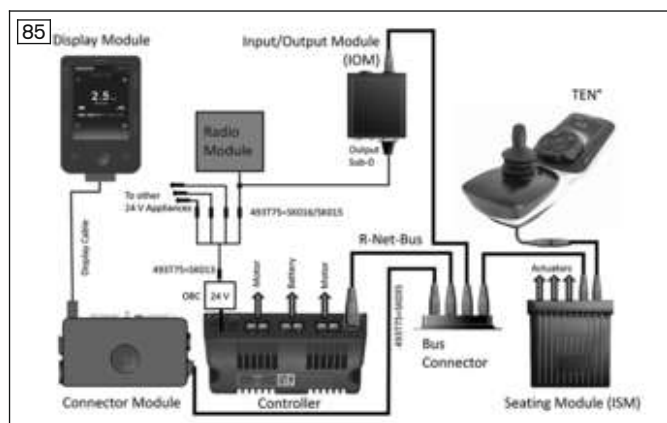
Environmental control with input/output module (IOM)

The illustration that follows shows a wiring example for a wireless module in combination with an input/output module (IOM)
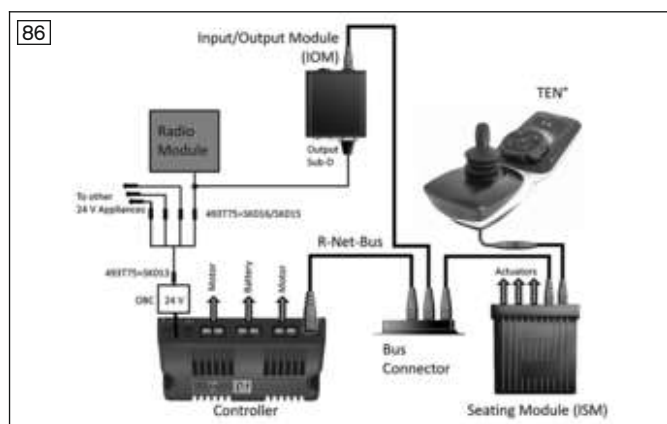
8.8.2 Programming

An input/output module (IOM) was mounted on the power wheelchair for operation of the wireless module. The programming described in the following was already completed at the factory.

The IOM can be configured either as an input or an output device. An internal switch is used to configure the IOM:
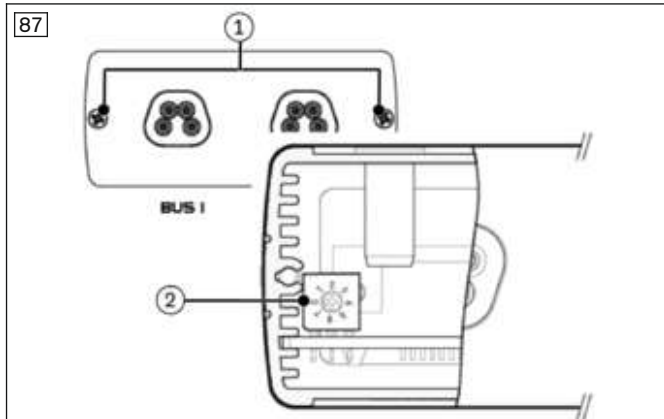
1) Disconnect all cables.
2) Loosen and remove the mounting screws (item 1) on the bus connection plate.
3) Carefully pull the connection plate slightly away from the housing. Ensure that the internal wiring is not damaged.
4) Configure the switch (item 2) as desired (see table).
5) Reposition the connection plate on the housing.
6) Insert and tighten the mounting screws.

Use as	Switch position	Designation in R-Net programming interface
Input device	0	IOM 1 (under Profile Management/Input Device Type)
	1	IOM 2 (under Profile Management/Input Device Type)
	2	IOM 3 (under Profile Management/Input Device Type)
Output device	3	IOM 1 (under Configuration/Mode Name)
	4	IOM 2 (under Configuration/Mode Name)
	5	IOM 3 (under Configuration/Mode Name)

Example: The IOM is to be used to control the wireless module. This requires configuration of the IOM as an output device. The switch in the IOM must be set to position 3 (arrow on mark 3).
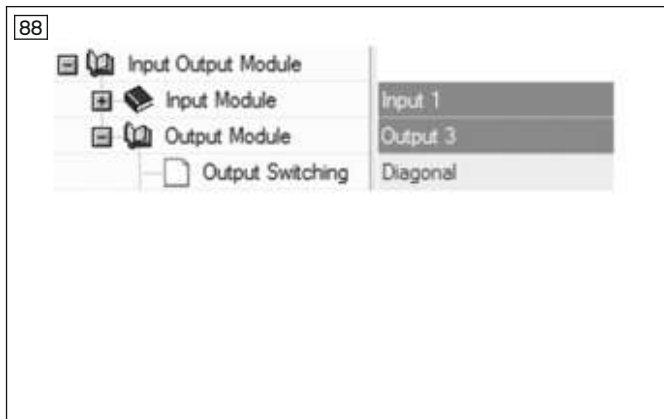
In the R-Net programming interface under **Input Output Module**, **Output Module**, the **Output Switching** parameter for the selected port (Port 3 in the example) must be set to **Diagonal** for operation of the wireless module with the IOM.

9 Delivery

9.1 Final inspection

A final inspection must be performed before delivery of the power wheelchair:

• Are all options installed according to the order form?
• Was the product fitted optimally to the physical and mental condition of the user (e.g. seat, arm support/side panel, leg supports, control panel)?
• Are the batteries charged?
• Is the tyre pressure correct (see tyre sidewall and the section "Technical data" for information)?
• Do all manual and power functions work properly?
• Do all control functions work properly?
• Do the brakes work?

• If intended: Are all options required to take part in road traffic installed and fully functional (e.g. warning triangle, lights, warning flashers)?

9.2 Transport to the customer

> ⚠ **CAUTION**
>
> **Securing the power wheelchair insufficiently during transport**
>
> Crushing, pinching of body parts due to failure to observe transportation instructions
>
> ▶ During transportation in vehicles or aircraft, on lifting platforms or in lifts, turn the control unit of the power wheelchair off and lock the brake.
>
> ▶ The power wheelchair must be secured in accordance with the regulations for the transport device.
>
> ▶ During transport in a vehicle, the power wheelchair must be secured sufficiently with cargo straps. Only attach the cargo straps to the corresponding transportation eyelets and specified tie-down points.

> **NOTICE**
>
> **Improper transport**
>
> Damage to the product due to failure to observe transportation instructions
>
> ▶ Ensure that the seat is lowered all the way and the backrest is in a vertical position prior to loading and for transporting the power wheelchair.
>
> ▶ Only use sufficiently large hoisting devices to transport the power wheelchair (see section "Technical data" for the weight of the power wheelchair).

> **NOTICE**
>
> **Use of unsuitable packaging**
>
> Damage to the product caused by transportation using incorrect packaging
>
> ▶ Use only the original packaging for delivery of the product.

9.2.1 Reducing the transportation size

The instructions for use (user) contain information on reducing the transportation size.

9.2.2 Preparing for transport
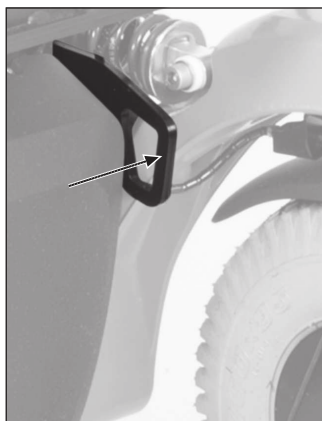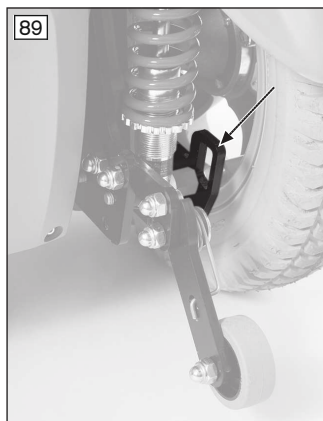
Transporting the power wheelchair

1) Position the power wheelchair in its transport location.
   INFORMATION: To lift or carry the power wheelchair, use the eyebolts in the front and back on the frame.
2) Turn the control unit off.
3) Verify brake locking. It should not be possible to push the power wheelchair.
   If needed: Lock the brake.
4) Use the eyebolts and cargo straps to attach the power wheelchair to the transport vehicle (see fig. 89, arrows).
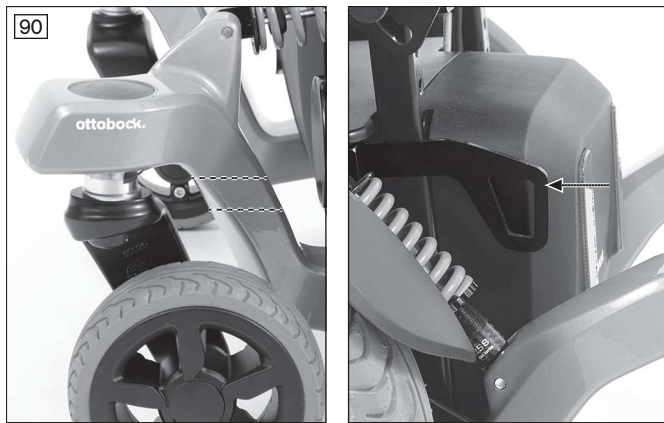
Transporting the power wheelchair

1) Position the power wheelchair in its transport location.
   If needed for lifting and carrying, use the eyebolts on the frame (see fig. 90, right) and the opposite caster wheel swing arms (see fig. 90, left).
   INFORMATION: Place respectively 2 x one belt loop around each caster wheel swing arm in the marked area.

2) Turn the control device off.

3) Verify brake locking. It should not be possible to push the power wheelchair.
   If needed: Lock the brake.

4) Use cargo straps to attach the power wheelchair to the transport vehicle. To do so, use the eyebolts on the frame (see fig. 90, right) and the opposite caster wheel swing arms (see fig. 90, left).
   INFORMATION: Place respectively 2 x one belt loop around each caster wheel swing arm in the marked area.

9.3 Handing over the product

> ⚠ **WARNING**
>
> **Lack of instruction**
>
> Tipping over, falling of the user due to lack of knowledge
>
> ► Instruct the user or the attendant in the proper use of the product when handing it over.

The following steps must be performed for the safe handover of the product:

- Have the user get into the product and perform a trial seat fitting. Pay special attention to proper positioning according to medical considerations.
- The user and any attendants must be instructed in the safe use of the product. In particular, the enclosed instructions for use (user) are to be used.
- The instructions for use (user) must be issued to the user or an attendant during handover of the wheelchair.
- The user or attendant should acknowledge that they have been instructed in how to use the product and were informed of the residual risks.
- **Depending on equipment:** The supplied instructions for use for accessories have to be handed over in addition.

10 Maintenance and repair

The manufacturer recommends regular maintenance of the product every **12 months**.

Further information on caring for the product and on maintenance/repair can be found in the instructions for use (user).

Detailed information on repairs and programming/troubleshooting of the control device can be found in the service manual.

11 Disposal

11.1 Disposal information

> **NOTICE**
>
> **Disposal of batteries**
>
> Pollution due to incorrect disposal
>
> ► Observe the information printed on the batteries by the manufacturer.
>
> ► Note that the batteries may not be disposed of as household waste.

All components of the product must be disposed of properly in accordance with the respective national environmental regulations.

11.2 Information on re-use

> ⚠ **CAUTION**
>
> **Used seat padding**
>
> Functional and/or hygienic risks due to re-use
>
> ► Replace the seat padding if the wheelchair is to be re-used.

The product is suitable for re-use.

Similar to second-hand machines or vehicles, products that are being re-used are subject to increased strain. Features and performance must not change in a way that could impair the safety of users or third parties during the period of use.

The relevant product must be thoroughly cleaned and disinfected before re-use. Then have the product inspected by qualified personnel with respect to its condition, wear and tear, and damage. Worn and damaged parts as well as components that do not fit or are unsuitable for the user must be replaced.

Detailed information on replacing components as well as information on the required tools can be found in the service manual.

12 Legal information

All legal conditions are subject to the respective national laws of the country of use and may vary accordingly.

12.1 Liability

The manufacturer will only assume liability if the product is used in accordance with the descriptions and instructions provided in this document. The manufacturer will not assume liability for damage caused by disregarding the information in this document, particularly due to improper use or unauthorised modification of the product.

12.2 Warranty

Further information on the warranty terms and conditions is available from the manufacturer's service (see inside back cover for addresses).

12.3 Lifetime

Expected lifetime: **5 years**

The design, manufacturing and requirements for the intended use of the product are based on the expected lifetime. These also include the requirements for maintenance, ensuring effectiveness and the safety of the product.

13 Technical data

> **INFORMATION**
>
> ► Much of the technical data below is given in mm. Please note that product settings – unless otherwise specified – cannot be adjusted in the mm range but only in increments of approx. **0.5 cm** or **1 cm**.
> ► Note that the values achieved during adjustment may deviate from the values specified below. The deviation can be **±10 mm and ±2°**.

> **INFORMATION**
>
> The following tables may contain technical data that do not apply to your product due to the selected configuration.

Application class (according to DIN EN 12184)
Class A

Application class (according to DIN EN 12184)
Class B

Drive type
Front-wheel drive

Drive type
Rear-wheel drive

Drive type
Mid-wheel drive

Mobility base
Size 1

Mobility base
Size 2

Weight (minimum/maximum)*	
Minimum weight	100 kg (220 lbs)
Maximum weight	200 kg (441 lbs)

Weight*	
Equipped with mobility base 1 + standard seat	from 110 kg (from 242.5 lbs)

Weight*	
Equipped with mobility base 2 + standard seat	from 125 kg (from 275.5 lbs)

* The product weight varies depending on the equipment selected.

Weight*	
Equipped with mobility base 1 + VAS seat	from 115 kg (from 253.5 lbs)

Weight*	
Equipped with mobility base 2 + VAS seat	from 130 kg (from 286.5 lbs)

* The product weight varies depending on the equipment selected.

Load	
Maximum load (User weight + luggage)	140 kg (308.6 lbs); the load is reduced depending on equipment

Load	
Maximum load (User weight + luggage)	160 kg (352.7 lbs); the load is reduced depending on equipment

Load	
Maximum load (User weight + luggage)	180 kg (397 lbs); the load is reduced depending on equipment

Load	
Maximum load (User weight + luggage)	200 kg (440.9 lbs); the load is reduced depending on equipment

Please note: With a standard seat Junior, the maximum load is reduced to 75 kg (165 lbs).

Dimensions – standard seat Junior	
Effective seat depth*	340–400 mm (13.4"–15.7")
Effective seat width*	340–400 mm (13.4"–15.7")
Anterior seat height*	410–570 mm (16.1"–22.4")
Lower leg length**	150–540 mm (5.9"–21.2")
Back support height	370/420/470 mm (14.6"/16.5"/18.5")
Arm support height (telescoping arm support)	185–225 mm (7.3"–8.8")

* In increments of 20 mm

** In increments of 10 mm

Dimensions – standard seat, small	
Effective seat depth*	380–460 mm (15"–18.1")
Effective seat width*	380–420 mm (15"–16.5")
Anterior seat height*	410–570 mm (16.1"–22.4")

Dimensions – standard seat, small	
Lower leg length**	150–540 mm (5.9"–21.2")
Back support height	450/500/550 mm (17.7"/19.7"/21.6")
Arm support height (telescoping arm support)	205–275 mm (8.1"–10.8")

* In increments of 20 mm

** In increments of 10 mm

Dimensions – standard seat, large	
Effective seat depth*	420–500 mm (16.5"–19.7")
Effective seat width*	440–480 mm (16.9"–18.9")
Anterior seat height*	410–570 mm (16.1"–22.4")
Lower leg length**	150–540 mm (5.9"–21.2")
Back support height	450/500/550 mm (17.7"/19.7"/21.6")
Arm support height (telescoping arm support)	205–275 mm (8.1"–10.8")

* In increments of 20 mm

** In increments of 10 mm

Dimensions – standard seat, XL	
Effective seat depth*	420–500 mm (16.5"–19.7")
Effective seat width*	500–560 mm (19.7"–22")
Anterior seat height*	410–570 mm (16.1"–22.4")
Lower leg length**	150–540 mm (5.9"–21.2")
Back support height	450/500/550 mm (17.7"/19.7"/21.6")
Arm support height (telescoping arm support)	205–275 mm (8.1"–10.8")

* In increments of 20 mm

** In increments of 10 mm

Note: Due to certain restrictions in the configuration, the actual front seat height deviates from the selected seat height by +- 10 mm.

Dimensions – VAS seat (all types)	
Effective seat depth*	380–580 mm (14.6"–22.8")
Effective seat width*	380–540 mm (15"–21.3")
Anterior seat height**	430–570 mm (16.9"–22.4")
Lower leg length***	150–540 mm (5.9"–21.3")
Back support height	450/510/530/550 mm (17.7"/20"/20.8"/21.6")
Arm support height (telescoping arm support)	185–255 mm (7.3"–10")

* Continuous

** In increments of 20 mm

*** In increments of 10 mm

Dimensions – Recaro® seat	
Effective seat depth	380–560 mm (15"–22.8")
Seat width*	Inside: 320–340 mm (12.6"–13.4")
	Outside: 450–480 mm (17.7"–18.9")
Seat height**	410–570 mm (16.1"–22.4")
Lower leg length	280–540 mm (11"–21.2")
Back height	620 mm (24.4")

* Inner seat width = effective seat width

** In increments of 20 mm

Dimensions and weights (front-wheel drive; mobility base = size 1)*	
Overall width (standard motor/performance or high performance motor)**	596 / 612 mm (23.5" / 24.1")
Overall height (equipped with standard seat)	850–1,110 mm (33.4"–43.7")
Overall height (equipped with VAS seat)	850–1,110 mm (33.4"–43.7")
Overall length (without leg support)	908 mm (35.75")
Overall length (with leg support)	Minimum: 1050 mm (41.3"); maximum: 1250 mm (49.2")
Arm support length (standard)	260 mm (10.2")
Foremost point of the side panel (measured to back support)	Minimum: 300 mm (11.8"); maximum: 580 mm (22.8")
Transport weights***	See "Weight", of this, weight of removable components: Leg support (standard): approx. 2.2 kg (4.9 lbs) Detachable side panel: approx. 3 kg (6.6 lbs) Leg support (power, with aluminium foot plate): approx. 6.5 kg (14.3 lbs)
Minimum turning radius	965 mm (38")
Ground clearance	80 mm
Caster wheel tyre size	9"/10"
Drive wheel tyre size	14"

Dimensions and weights (front-wheel drive; mobility base = size 2)*	
Overall width (standard motor/performance or high performance motor)**	626 / 642 mm (24.6" / 25.3")
Overall height (equipped with standard seat)	850–1,110 mm (33.4"–43.7")
Overall height (equipped with VAS seat)	850–1,110 mm (33.4"–43.7")
Overall length (without leg support)	968 mm (38.1")
Overall length (with leg support)	Minimum: 1050 mm (41.3"); maximum: 1250 mm (49.2")
Arm support length (standard)	260 mm (10.2")
Foremost point of the side panel (measured to back support)	Minimum: 300 mm (11.8"); maximum: 580 mm (22.8")
Transport weights***	See "Weight", of this, weight of removable components: Leg support (standard): approx. 2.2 kg (4.9 lbs) Detachable side panel: approx. 3 kg (6.6 lbs) Leg support (power, with aluminium foot plate): approx. 6.5 kg (14.3 lbs)
Minimum turning radius	965 mm (38")
Ground clearance	80 mm
Caster wheel tyre size	9"/10"
Drive wheel tyre size	14"

* Depending on equipment selected

** May be larger due to seat width adjustment. Overall width +180 mm in the assembled state.

*** Weight of the heaviest component

Dimensions and weights (rear-wheel drive; mobility base = size 1)*	
Overall width (standard motor/performance or high performance motor)**	596 / 612 mm (23.5" / 24.1")
Overall height (equipped with standard seat)	850–1,110 mm (33.4"–43.7")
Overall height (equipped with VAS seat)	850–1,110 mm (33.4"–43.7")
Overall length (without leg support)	850 mm (33.5")
Overall length (with leg support)	Minimum: 1050 mm (41.3"); maximum: 1250 mm (49.2")
Arm support length (standard)	260 mm (10.2")

Dimensions and weights (rear-wheel drive; mobility base = size 1)*	
Foremost point of the side panel (measured to back support)	Minimum: 300 mm (11.8"); maximum: 580 mm (22.8")
Transport weights***	See "Weight", of this, weight of removable components: Leg support (standard): approx. 2.2 kg (4.9 lbs) Detachable side panel: approx. 3 kg (6.6 lbs) Leg support (power, with aluminium foot plate): approx. 6.5 kg (14.3 lbs)
Minimum turning radius	965 mm (38")
Ground clearance	80 mm
Caster wheel tyre size	9"/10"
Drive wheel tyre size	14"

Dimensions and weights (rear-wheel drive; mobility base = size 2)*	
Overall width (standard motor/performance or high performance motor)**	626 / 642 mm (24.6" / 25.3")
Overall height (equipped with standard seat)	850–1,110 mm (33.4"–43.7")
Overall height (equipped with VAS seat)	850–1,110 mm (33.4"–43.7")
Overall length (without leg support)	870 mm (34.3")
Overall length (with leg support)	Minimum: 1050 mm (41.3"); maximum: 1250 mm (49.2")
Arm support length (standard)	260 mm (10.2")
Foremost point of the side panel (measured to back support)	Minimum: 300 mm (11.8"); maximum: 580 mm (22.8")
Transport weights***	See "Weight", of this, weight of removable components: Leg support (standard): approx. 2.2 kg (4.9 lbs) Detachable side panel: approx. 3 kg (6.6 lbs) Leg support (power, with aluminium foot plate): approx. 6.5 kg (14.3 lbs)
Minimum turning radius	965 mm (38")
Ground clearance	80 mm
Caster wheel tyre size	9"/10"
Drive wheel tyre size	14"

* Depending on equipment selected

** May be larger due to seat width adjustment. Overall width +180 mm in the assembled state.

*** Weight of the heaviest component

Dimensions and weights (mid-wheel drive; mobility base = size 1)*	
Overall width (standard motor/performance or high performance motor)**	596 / 612 mm (23.5" / 24.1")
Overall height (equipped with standard seat)	850–1,110 mm (33.4"–43.7")
Overall height (equipped with VAS seat)	850–1,110 mm (33.4"–43.7")
Overall length (without leg support)	908 mm (35.75")
Overall length (with leg support)	Minimum: 1050 mm (41.3"); maximum: 1250 mm (49.2")
Arm support length (standard)	260 mm (10.2")
Foremost point of the side panel (measured to back support)	Minimum: 300 mm (11.8"); maximum: 580 mm (22.8")
Transport weights***	See "Weight", of this, weight of removable components: Leg support (standard): approx. 2.2 kg (4.9 lbs) Detachable side panel: approx. 3 kg (6.6 lbs) Leg support (power, with aluminium foot plate): approx. 6.5 kg (14.3 lbs)
Minimum turning radius	750 mm (29.5")
Ground clearance	80 mm (3")

Dimensions and weights (mid-wheel drive; mobility base = size 1)*	
Tyre size front/rear	6"
Drive wheel tyre size	14"

Dimensions and weights (mid-wheel drive; mobility base = size 2)*	
Overall width (standard motor/performance or high performance motor)**	626 / 642 mm (24.6" / 25.3")
Overall height (equipped with standard seat)	850–1,110 mm (33.4"–43.7")
Overall height (equipped with VAS seat)	850–1,110 mm (33.4"–43.7")
Overall length (without leg support)	968 mm (38.1")
Overall length (with leg support)	Minimum: 1050 mm (41.3"); maximum: 1250 mm (49.2")
Arm support length (standard)	260 mm (10.2")
Front position of the arm supports (measured to the back support)	Minimum: 300 mm (11.8"); maximum: 580 mm (22.8")
Transport weights***	See "Weight", of this, weight of removable components: Leg support (standard): approx. 2.2 kg (4.9 lbs) Detachable side panel: approx. 3 kg (6.6 lbs) Leg support (power, with aluminium foot plate): approx. 6.5 kg (14.3 lbs)
Minimum turning radius	750 mm (29.5")
Ground clearance	80 mm (3")
Tyre size front/rear	6"
Drive wheel tyre size	14"

* Depending on equipment selected

** May be larger due to seat width adjustment. Overall width +180 mm in the assembled state.

*** Weight of the heaviest component

Transportation size (storage length x storage width x storage height)	
Storage length	1100 mm (43.3")
Storage width	Minimum: 596 mm (23.5"); maximum: 630 mm (24.8")
Storage height	500 mm (19.7")

Seat and back support adjustment	
Seat inclination*	Minimum: 0°; maximum: 45°
Set pre-tilt of the seat	-3°/0°/3°/6°/9° (depending on order and/or selected option)
Back support angle**	Minimum: 90°; maximum: 120°
Leg support angle***	Minimum: 90°; maximum: 165°

* Maximum value only with power seat tilt option; specifications do not take set pre-tilt into account

** Specifications do not take set pre-tilt into account

*** * Maximum value only with power leg support option + manually adjustable leg supports; specifications do not take set pre-tilt into account

Seat function (power)	
Back support angle adjustment*	Continuously adjustable up to 30°
Seat tilt*	Adjustable up to 45° (with centre of gravity shift)
Seat height adjustment*	Adjustable up to 350 mm (13.8"); max. load: up to 180 kg (397 lbs)
Combined seat height adjustment/seat tilt*	Seat height adjustment: adjustable up to 350 mm (11.8"); seat tilt: adjustable up to 45°; max. load: up to 180 kg (397 lbs)
Leg supports*	Continuously adjustable up to 75°

* Depending on equipment selected

Seat function (manual)	
Back angle adjustment	Adjustable by up to 30°

Seat function (manual)	
Legrests	Adjustable by up to 75°

Drive wheels	
Wheel size	14"
Tyre type	Pneumatic tyres
Tyre pressure	Adjust the tyre pressure according to the specifications on the tyre sidewall to prevent injuries or damage to the product: 3.5 bar/350 kPa/50 PSI

Drive wheels	
Wheel size	14"
Tyre type	PU tyres

Caster wheels	
Wheel size	10"
Tyre type	Pneumatic tyres
Tyre pressure	Adjust the tyre pressure according to the specifications on the tyre sidewall to prevent injuries or damage to the product: 3.5 bar/350 kPa/50 PSI

Caster wheels	
Wheel size	9"
Tyre type	Pneumatic tyres
Tyre pressure	Adjust the tyre pressure according to the specifications on the tyre sidewall to prevent injuries or damage to the product: 3.5 bar/350 kPa/50 PSI

Caster wheels	
Wheel size	10"
Tyre type	PU tyres

Caster wheels	
Wheel size	9"
Tyre type	PU tyres

Caster wheels	
Wheel size	6"
Tyre type	PU tyres

Driving data (rear-wheel drive/front-wheel drive)	
Speed*	See nameplate for precise information: 6 km/h (3.7 mph); 7.2 km/h (4.4 mph); 10 km/h (6.2 mph); 14 km/h (8.7 mph)
Climbing ability (base model)**	10° (17.5 %)
Dynamic stability – uphill***	10° (17.5 %)
Static stability – uphill/downhill	10° (17.5 %)
Static stability – sideways	10° (17.5 %)
Maximum obstacle height	With front-wheel drive: 75 mm (3")
	With rear-wheel drive: 50 mm (2"); with curb climbing assist: 100 mm (4")
Braking distance (according to DIN EN 12184)****	At 6 km/h (3.7 mph): 1,000 mm (39.4") – horizontal
	At 7.2 km/h (4.4 mph): 1,200 mm (47.2") – horizontal
	At 10 km/h [6.2 mph]: 2,100 mm (82.7") – horizontal
	At 14 km/h [8.7 mph]: 3,900 mm (153.5") – horizontal

Driving data (front-wheel drive)	
Speed*	See nameplate for precise information: 6 km/h (3.7 mph); 7.2 km/h (4.4 mph); 10 km/h (6.2 mph)
Climbing ability (base model)**	6° (10.5 %)

Driving data (front-wheel drive)	
Dynamic stability – uphill***	6° (10.5 %)
Static stability – uphill/downhill	6° (10.5 %)
Static stability – sideways	6° (10.5 %)
Maximum obstacle height	50 mm (3")
Braking distance (according to DIN EN 12184)****	At 6 km/h (3.7 mph): 1,000 mm (39.4") – horizontal At 7.2 km/h (4.4 mph): 1,200 mm (47.2") – horizontal At 10 km/h [6.2 mph]: 2,100 mm (82.7") – horizontal

* The specified speed can vary by ±10%.

** The control device and the motors must be protected against overloading. For this reason, the continuous climbing ability depends on the overall weight (wheelchair weight + user weight + luggage) as well as the ground conditions, exterior temperature, battery voltage and user's driving style. In individual cases, the continuous climbing ability can be significantly lower than the value specified.

*** Approved climbing ability with lowered seat functions, upright back support and lowered leg supports.

**** The braking distance can be correspondingly longer due to user weight, luggage, installed options and condition of the tyres, and due to weather and surface conditions.

Driving data (mid-wheel drive)	
Speed*	See nameplate for precise information: 6 km/h (3.7 mph); 7.2 km/h (4.4 mph); 10 km/h (6.2 mph)
Climbing ability (base model)**	10° (17.5 %)
Dynamic stability – uphill***	10° (17.5 %)
Static stability – uphill/downhill	10° (17.5 %)
Static stability – sideways	10° (17.5 %)
Maximum obstacle height	65 mm (2.5")
Braking distance (according to DIN EN 12184:2014)****	At 6 km/h (3.7 mph): 1,000 mm (39.4") – horizontal At 7.2 km/h (4.4 mph): 1,200 mm (47.2") – horizontal At 10 km/h [6.2 mph]: 2,100 mm (82.7") – horizontal

Driving data (mid-wheel drive)	
Speed*	See nameplate for precise information: 6 km/h (3.7 mph); 7.2 km/h (4.4 mph); 10 km/h (6.2 mph)
Climbing ability (base model)**	6° (10.5 %)
Dynamic stability – uphill***	6° (10.5 %)
Static stability – uphill/downhill	6° (10.5 %)
Static stability – sideways	6° (10.5 %)
Maximum obstacle height	50 mm (2.5")
Braking distance (according to DIN EN 12184:2014)****	At 6 km/h (3.7 mph): 1,000 mm (39.4") – horizontal At 7.2 km/h (4.4 mph): 1,200 mm (47.2") – horizontal At 10 km/h [6.2 mph]: 2,100 mm (82.7") – horizontal

* The specified speed can vary by ±10%.

** The control device and the motors must be protected against overloading. For this reason, the continuous climbing ability depends on the overall weight (wheelchair weight + user weight + luggage) as well as the ground conditions, exterior temperature, battery voltage and user's driving style. In individual cases, the continuous climbing ability can be significantly lower than the value specified.

*** Approved climbing ability with lowered seat functions, upright back support and lowered leg supports.

**** The braking distance can be correspondingly longer due to user weight, luggage, installed options and condition of the tyres, and due to weather and surface conditions.

Range (on level surfaces)*	
Battery with 39 Ah (C5) / 50 Ah (C20)	approx. 25 km (15.5 miles)

* The specified range was determined under defined conditions according to ISO 7176-4. In practice the range can be reduced by up to **50%**. For information on this, see the section "Range" in the instructions for use (user).

Range (on level surfaces)*	
Battery with 53 Ah (C5) / 62 Ah (C20)	approx. 26 km (16 miles)

* The specified range was determined under defined conditions according to ISO 7176-4. In practice the range can be reduced by up to **50%**. For information on this, see the section "Range" in the instructions for use (user).

Driving distance range (on level surfaces)*	
Battery with 56 Ah (C5) / 60,4 Ah (C20)	Approx. 35 km (22 miles)

* The specified driving distance range was determined under defined conditions according to ISO 7176-4. In practice the driving distance range can be reduced by up to **50%**. For information on this, see the section "Driving distance range" in the instructions for use (user).

Range (on level surfaces)*	
Battery with 63 Ah (C5) / 74 Ah (C20)	Approx. 35 km (22 miles)

* The specified range was determined under defined conditions according to ISO 7176-4. In practice the range can be reduced by up to **50 %**. For information on this, see the section "Range" in the instructions for use (user).

Range (on level surfaces)*	
Battery with 75 Ah (C5) / 80 Ah (C20)	approx. 40 km (24.8 miles)

* The specified range was determined under defined conditions according to ISO 7176-4. In practice the range can be reduced by up to **50%**. For information on this, see the section "Range" in the instructions for use (user).

Electrical system*	
IP protection rating (according to DIN EN 60529)	IP44
Operating voltage	24 V DC
Lighting LED front light LED rear light	 24 V, maintenance-free 24 V, maintenance-free
Automatic circuit breaker	100 A
Battery charger	For more information see the included battery charger instructions for use

* The product meets all requirements under ISO 7176-14.

Battery	
Batteries	2 x 12 V; 39 Ah (C5) / 50 Ah (C20); gel; maintenance-free

Battery	
Batteries	2 x 12 V; 53 Ah (C5) / 62 Ah (C20); AGM; maintenance-free

Battery	
Batteries	2 x 12 V; 56 Ah (C5) / 60,4 Ah (C20); AGM; maintenance-free

Battery	
Batteries	2 x 12 V; 63 Ah (C5) / 75 Ah (C20); AGM; maintenance-free

Battery	
Batteries	2 x 12 V; 63 Ah (C5) / 74 Ah (C20); gel; maintenance-free

Battery	
Batteries	2 x 12 V; 75 Ah (C5) / 80 Ah (C20); AGM; maintenance-free

Battery (not delivered by Ottobock)	
Required specifications	2 x 12 V; up to max. 75 Ah (C5)/ up to max. 92 Ah (C20); gel or AGM; maintenance-free

Battery charger (not supplied by Ottobock)*	
Required minimum specifications**	Battery chargers for a rated battery capacity of 25–55 Ah: 8 A
	Battery chargers for a rated battery capacity of 45–65 Ah: 10 A
	Battery chargers for a rated battery capacity of 55–75 Ah: 12 A***
	Protective insulation (class 2) according to IEC 60335-2-29; protection rating: IP21 (Ottobock recommends battery chargers with a protection rating of IP21)
	The battery charger fulfils the normative requirements of EN 12184.

Battery charger (not supplied by Ottobock)*	
	This also includes the requirements according to ISO 7176-14 (battery charger with reverse polarity protection; battery charger charges batteries to at least 80 per cent within 8 hours; battery charger includes information regarding nominal capacity and the possibility of charging overnight; battery charger indicates that the battery is properly connected)
	The device fulfils the normative requirements of ISO 7176-21 and ISO 7176-25.

* For further details, see the instructions for use supplied with the battery charger.

** Note the deviating information of individual battery manufacturers.

*** 12 A only when charging via a separate charging receptacle.

Control device	
Model	VR2*
Max. output current per motor	90 A
Force for operating the joystick on the standard control panel	1.6 N

* Without power seat functions, without lights

Control device	
Model	VR2
Max. output current per motor	90 A
Seat functions that can be controlled	Maximum 2
Force for operating the joystick on the standard control panel	1.6 N

Control device	
Model	R-Net (controller in combination with TEN° control panel)
Max. output current per motor	90 A
Seat functions that can be controlled	1 (for direct control without actuator module)
Force for operating the joystick on the standard control panel	1.6 N

Control device	
Model	R-Net (controller in combination with TEN° control panel)
Max. output current per motor	120 A (seat functions are controlled via the separate actuator module)
Force for operating the joystick on the standard control panel	1.6 N

Control device	
Model	R-Net (controller in combination with JSM-LED-L control panel)
Max. output current per motor	120 A
Seat functions that can be controlled	1 (for direct control without actuator module)
Force for operating the joystick on the standard control panel	1.6 N

Control device accessories	
Model	TEN° LCD module
Nominal input voltage	24 V
Operating voltage range	16–33 V
Absolute maximum voltage	35 V
Weight	Display module: 120 g Connection module: 200 g
Case material	Plastic
Protection rating	IPX4
IR frequency range	10–455 kHz

Control device accessories	
Sip and puff control port	Full puff pressure: approx. 69 mbar
	Full sip pressure: approx. -83 mbar

Control device accessories	
Model	R-Net actuator module for controlling up to 6 seat functions
Max. output current per motor	15 A

Allowable environmental conditions	
Operating temperature	-15 °C to +40 °C (+5 °F to +104 °F)
Transport and storage temperature	-15 °C to +40 °C (+5 °F to +104 °F)
Relative humidity	45 % to 85 %; non-condensing

Corrosion protection	
Corrosion protection	Cathodic dip coating / powder coating

14 Appendices

14.1 Required tools

The following tools are required for adjustments and maintenance work:

- Allen wrenches in sizes 3, 4, 5, 6
- Ring and open-ended wrenches in sizes 10, 11, 13, 19 and 24
- Torque wrench (measurement range 5-50 Nm)
- Drill; twist drill Ø 6.4 mm
- Phillips head screwdriver (size: 2)
- 90° spherical countersink 8 mm

14.2 Torque values of the screw connections

Unless otherwise specified, screw connections are tightened with the following torque values:

- Thread diameter M4: 3 Nm
- Thread diameter M5: 5 Nm
- Thread diameter M6: 10 Nm
- Thread diameter M8: 25 Nm

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