Völker Hospital Bed
Instructions for use

Model S 960-1 (E)

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Klinikbetten

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Introduction

We congratulate you on your decision to buy a Völker hospital bed and we thank you for having confidence in our company and our products.

It is certainly true that you were advised in detail and convinced of the many benefits of our hospital beds before buying. These benefits can actually be found only in this combination of hospital beds.
The fact that a Völker hospital bed, with all the functionality and many benefits, does not look like a hospital bed, has certainly made your purchase much more pleasant.

These instructions for use shall inform you on the technical equipment of the Völker hospital bed and assist you in handling and using all of its functions.

Heinrich Völker

Executive board (chair)
Völker AG

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1. General

1.1 General notes

Thank you for purchasing a Völker hospital bed. This hospital bed was manufactured according to national and international norms and standards and complies with the current state-of-the-art technology.

Völker hospital beds meet the demands on safety and functionality. They were tested against international norms and are designated with the CE seal, confirming that basic requirements for medical products are met.

Please read the basic safety regulations. Please also follow the additional notes given on the following pages (especially with regard to potential warranty claims).

1.2 Standard model

The S960-1 standard model can be delivered in different variants. These variants are as follows:

Variant	Description
Lifting receiver	There are two options available: Double internal receiver. The lifting receiver is located at the left and right inner side of the head wall. Single external receiver. The lifting receiver is located in the middle, i.e. outside the lying surface.

Description	Variant		
Joint edge	The joint edges come in standard grey.		
Manual control unit	The manual control unit is available with hooks.		
Castors	The castors are in standard design TENTE Integral 150mm, but various customized kinds of castors can be delivered. The designs and the diameters, too, are variable. This might result in a lifting adjustment range varying by 20 mm.		
Head and foot parts	With regard to our different variants of head and foot parts please take note of our brochure.		
Bed extension piece	In order to place a longer mattress, it might become necessary to install a bed extension piece. Using this bed extension piece, you can extend the bed by 200 mm. The bed extension piece comprises a pull-out attachment for moving the foot part and a metal frame for extending the lying surface.		
Lateral grids	The S960-1 bed can be provided in different lateral grid variants:		
		Foot part:	Head part:
	1.	Extendible lateral grid 22 to 34 cm	Extendible lateral grid, 22 to 34 cm
	2.	Extendible lateral grid, 34 to 46 cm	Extendible lateral grid, 34 to 46 cm

* This dimension refers to the top edge of the lateral grid up to the lying surface.

All the possible variants are described in these instructions for use. If you would like to ask for spare parts it is essential that you first determine for which variant you need the spare parts and then determine the corresponding parts list.

In the beds' order specification, you will find an overview of the variants delivered. If it is for a deviation of the standard specification, for example regarding the outer dimensions, it is also recorded here. If the original order specification is not available any more, please contact the Völker customer service.

1.3 Copyright protection

Providing a Third Party with the instructions for use is permissible only after prior written approval by the Völker AG. All the documents are protected by copyright laws.

Unless explicitly granted the right to do so, it is forbidden to pass on or duplicate any documents, also in parts, make use of them or communicate their contents. Violations against these regulations present an offence and oblige to damage compensation. We reserve all rights for exercising commercially protected privileges.

1.4 Warranty and liability

Within the bounds of the warranty obligations undertaken by the main contract, the Völker AG is liable for potential defects or omissions, excluding further claims. Compensation claims, no matter on which legal argument they are based, are excluded.

We reserve the right to technical changes within the bounds of further development of the hospital beds covered in this service manual.

We do not accept responsibility for damages and operational breakdowns which are caused by operating errors and non-compliance with these service instructions.

The accessories drawn do not necessarily correspond to the graphic illustrations.

2. Safety regulations

2.1 Explanation of symbols

Warning notice

Information marked by this symbol must absolutely be read and adhered to!

Gleichstrom

Wechselstrom

Device acc. to safety class II (double protective insulation)

Type B device according to DIN EN 60601-1

These instructions for use shall provide practical information ensuring the safe use and maintenance of the bed in accordance with the regulations.
Everybody who is in charge of starting up, operating or servicing the bed must have these instructions for use to hand. In order to avoid operating errors and to ensure smooth operation of the bed, these notices must always be available to the nursing staff.

2.2 Testing the functional safety and condition of the bed

After carrying out maintenance work or repairs, the bed must be checked for its functional safety. Check whether the bed can be used in accordance with the specifications without any hazards for patients, users or any third party.
Performance control and technical check must be carried out at least once a year.

2.3 MPG §3, Section 1

The hospital bed may only be set up, operated and used according to its intended use to be in compliance with the regulations of the “Law for Medical Products” (MPG) and related statutory orders issued and the recognised rules of engineering as well as the regulations for industrial safety and the prevention for industrial accidents. A hospital bed ***must not*** be operated if it is defective and might put patients, nursing staff or any third party at risk.
The hospital bed may only be operated by persons who can guarantee workmanlike handling on account of their training or skills and experiences.

2.4 Intended use

Völker's hospital beds, model S 960-1, are intended for laying patients in sick rooms of hospitals, clinics and nursing homes.
Patients below the age of 12 years may only be bedded in the model S 960-1 hospital bed if the necessary safety measures, such as lateral grid protection covers, are used.
Any other use deviating from the intended use of the Völker hospital bed is excluded from potential liability.

2.5 Misuse

Misuse of the hospital bed may lead to potential dangers. These include, for example:

- improper operation of electric functions and uncontrolled positioning,
- using the hospital bed for children below the age of 12 years,
- operating the hospital bed by patients without prior introduction,
- simultaneously operating electric functions by different persons, continuously pressing the buttons,
- using electrical appliances at the bed which are not intended for it (subject to the due diligence of the operator),
- pulling at cords in order to move the bed,
- loosening electric connectors by pulling at the cord,
- using the bed on a sloping surface exceeding an inclination of 10 degrees (the bed's brake is designed for a maximum angle of tilt of 10 degrees),
- trying to move the bed, although the locking function in engaged,
- using the bed for ambulant services using a vehicle,
- overloading the bed beyond the specified safe load-bearing capacity.

2.6 Electromagnetic/electrostatic interferences

The S 960-1 hospital bed fulfils the EMV safety requirements (electromagnetic compatibility) according to the "Law for Medical Products" (MPG). It was tested to comply with the norm EN 60601-1-2.

2.7 Before initial start-up

Before initially putting the hospital bed into operation, these instructions for use must have been read in detail by the persons responsible for the nursing service.
Before the hospital bed is put into operation for the first time, a performance control according to chapter 6.2 must have been carried out.
Before the bed is put into operation, the nursing staff must have attended detailed training in the handling of the bed. In addition, it must be pointed to potential hazards which might occur in spite of properly operating of the bed.

2.8 Testing the functional safety and condition of the beds

Before the bed is used, the operator must satisfy himself/herself that the hospital bed is in proper condition and a safe use is guaranteed. This check is not only to be carried out prior to the first use but also during the current use of the bed. If necessary, the hospital bed has to be checked daily or with any change of shift in order to ensure that no one can be put at risk by its use. In order to reduce the maintenance of the bed to the necessary minimum level, the hospital bed should be cleaned, disinfected and tested as soon as possible after each use so that it can be used again immediately without any risk. (Please also see chapter 6 regarding this). Please note that processing the bed in automatic treatment plants is contrary to this principle, see chapter 3:
In case of a defective bed it may become necessary to provide the patient with an other hospital bed.

2.9 Position of the hospital bed

"Danger of falling out"
With unsupervised patients it is recommended to put the bed into its lowest position in order to minimize the risk of injury in case of the patient falling out of the bed. Otherwise it is a good idea to adjust the height of the bed in relation to the height of the patient.

2.10 Four castors central braking

"Attention! Risk of accidents"
Unless the bed is used for transport purposes, the castors must always be in parked condition, because the bed might be used by patients as a support when getting up or lying down. When the bed is not in parked condition, thus moving away, it may lead to the patient having a bad fall. After operating the central locking brake it must be checked whether the bed is actually fixed, that is whether the castors' brake is sufficiently engaged.

2.11 Height adjustment

"Danger of getting stuck between undercarriage and frame when the bed is lowered"
When the bed is adjusted it has to be ensured that no persons, limbs, bed linen or other objects are between the frame and undercarriage.

2.12 Assist rail – "Danger of getting stuck"

With patients whose physical or mental condition seems to make it necessary to use the assist rail in order to protect them against falling out of the bed, the following safety measures must be adhered to:

The assist rail may be used only by trained nursing staff.

Make sure that the assist rails – or parts thereof – are either completely folded up and locked or completely folded down.

It has to be ensured that the patient is not getting into touch with the assist rail elements when operating the electric lying surface adjustment. It is likewise important that no part of the body projects from the assist rail.

If assist rails are used for a child or a person whose mental condition appears to make it necessary to use such a device, it has to be ensured that the manual control unit is put out of their reach. In addition, it is recommended to use lateral grid protection covers.

If the above mentioned safety measures are ignored by the nursing staff, haematomas or other injuries might occur if patients get their hands, knees, fingers, feet, shins and hips caught.

2.13 Cleaning and disinfection

Dangers might occur by improper cleaning/disinfections of the bed.

2.14 Service/Maintenance

The S 960-1 only requires little maintenance. All flexible parts of the height adjustment unit, the lying surface drives and assist rail parts are provided with lifetime lubrication by the factory. When these parts are commonly used and cleaned, they will not have to be lubricated again. However, the manufacturer assumes that the hospital beds will be examined in regular intervals, at least once per year and detected damages like signs of wear and tear, loose bolts or breaks will be immediately removed. For further information please see the service manual.

Every person who is in charge of carrying out maintenance as well as services, must at least have read

the Safety Regulations

and

the Service Manual

and be qualified according to the requirements set out in MPBetreibV § 4 and 6.

In order to avoid errors und to ensure trouble-free operation of our hospital beds, these papers must always be available to the service staff.

Before starting maintenance work, the service manual and the instructions for use must be read in detail by the persons in charge for these services.
The hospital beds are not flameproof which is why they may be serviced only in an environment that is free of combustible substances.

Every time the bed has not been used for a while a function control have to be done.

During the maintenance and technical control the following guidelines have to be strictly followed.

The electrical installation of the room must accord to the actual state of technology and the hospital bed have to be used as intended.

The brakes must be fully applied.

The hospital beds are not flameproof which is why they may be serviced only in an environment that is free of combustible substances.

Main points of the functional control :

- Visual inspection of all important components on damage, abnormal wear, forming and contamination.
- Function control of all adjustable functions before start-up, after longer disuse and relocation of the bed.
- Function control of the brakes (safety, arrest, freewheel)
- Function control of all drives (checking the whole adjustable range, limit switch)
- Check of all jacks, connectors and LED-covers (before cleaning) on damages, which may cause an intrusion of wetness.
- Check all cables (electric supply and internal cabling) on damages, correct cable route and correct connection of all contacts.

Always secede the battery from the bed during maintenance !

After maintenance (repair) it is absolute required to check the bed for functional safety. You have to check if the bed can be used without causing damages to the patients and employees.

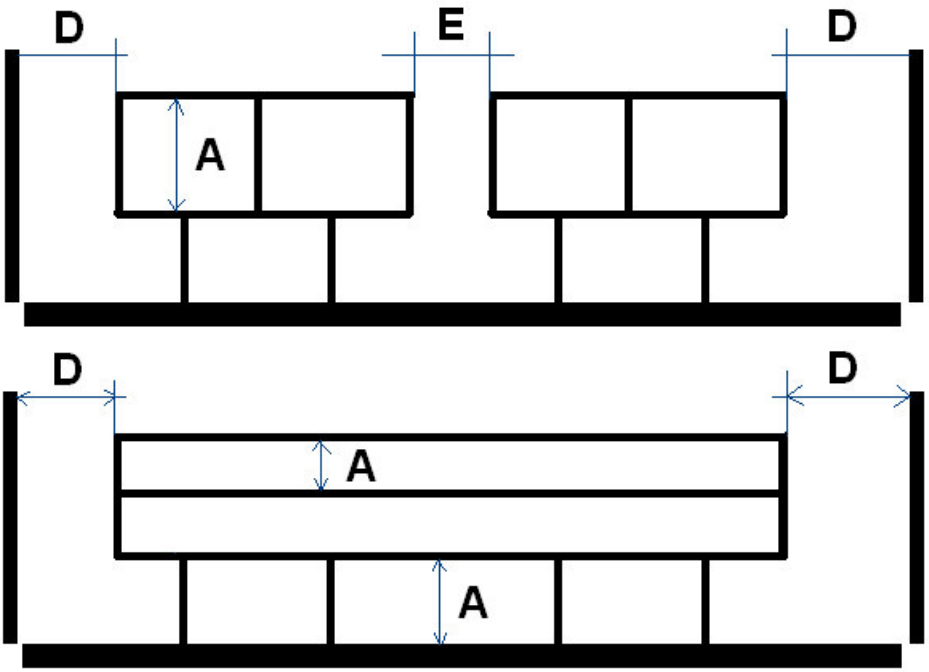
Execution of the technical control :

1. **Visual inspection**

   Check the parts of the frame on plastically deformations and/or wear. (e.g. all elements of the mattress frame (back-, sitting-, upper leg- and lower leg section), hub, lifting receiver, castors) .

2. **Functional check of the safety frames**

   Check if the locking mechanism of the safety frame is working faultless and if deformations or wear are observable.
   Check if the mandatory distances are adhered while the safety frame is under load.



A* - The smalles dimension between elements inside of the perimeter of side rail in its raised/locked positions or perimeters created between the siderail and fixed parts of the bed

D* - Distance between head panel or foot panel and side rail

E* - Distance between segmented side rails with the mattress support platform in the flat position <=60mm or >=235mm

During this checkup possible accessoires like the middle disk for the safety frames have to be accounted !

3. Functional check brakes

Check the functional efficiency of the brakes (safety, arrest, freewheel).

4. Functional check of the drives

Check the whole adjustable range of each drive. Pay attention to abnormal noises, the speed, smooth running etc. and that the selected function drives in the right direction. Especially pay attention to the fact that the drives stops singly when reaching its end position*.

*(The respective end position may vary dependant on the model of the bed. For further information pay attention to our technical technical specifications. If you have any questions please contact our service department.)

5. Electric supply

Check

- the electric supply cable including the grommet
- the cord grip including the bend protection mantle
- the main supply connector

on damages.

6. Internal cabling

Check the cable routing and the correct connection of the wrap connections on damages. Check the cables on damages.

7. Casing

Check all casings on damages. All screws have to be tightened. The seals must not show any signs of visible damage.

8. Mechanical inspection

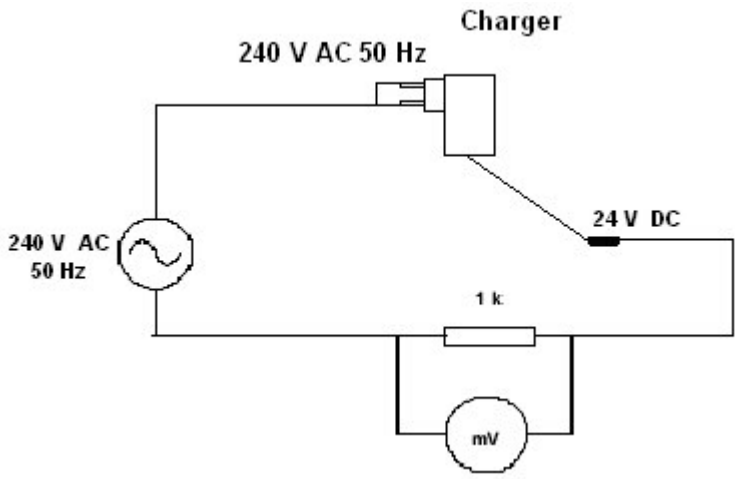
Check the functional efficiency of the raster and (if exisiting) the pneumatic spring, by bringing the foot section manual in ist different positions.

9. Battery (only S 960-2)

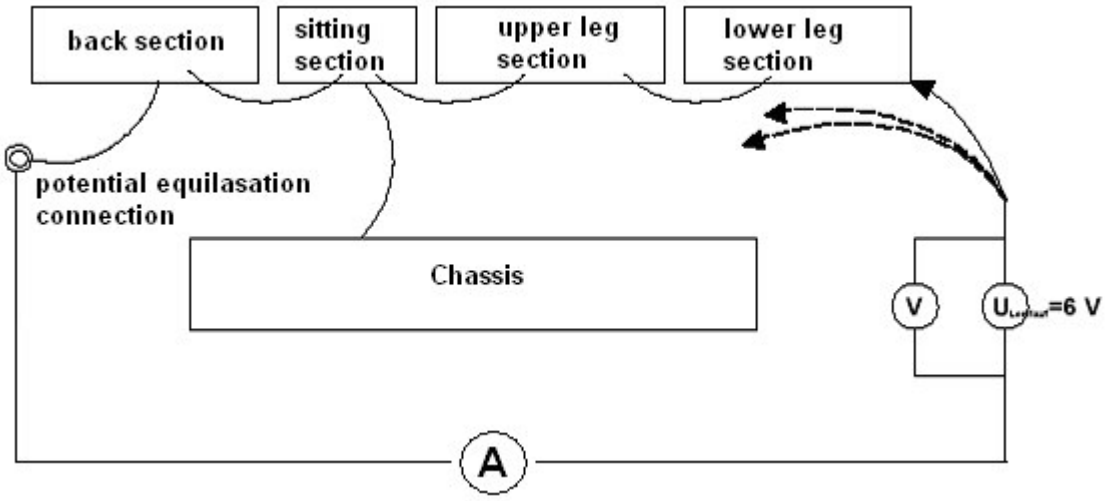
Change the 9V battery in a frequency of two years. Only use brands and dispose the old batteries in an environment-friendly way.

10. Measurement according to VDE 0751

The electrical inspection of the bed has to be carried out according to DIN VDE 0751-1 agreeable to the accident prevention regulation. You have to measure the leakage current. The legal limit amounts 0,5 mA.



Furthermore you have to measure the impedance between the back- , sitting- , upper leg- and lower leg section and the potential equalisation connection. The impedance must be lesser than 0,3 Ω . (I=5...25 A, R=U / I < 0,3 Ohm).



3. Technical specifications

3.1 Technical Data

Length	226 cm
Width	99 cm
Height, top edge head-/foot board	76.5 cm up to about 116.5 cm
Castors	4 , ∅ 150 mm, 120 kg Tente, integral castors
Max. castor load	100 kg (dynamic)
Height adjustment range (dependent on the type of castor)	approx. 40 cm to 80 cm
Lifting range	40 cm
Mattress displacement	15 cm
Dead weight	146 kg
Safe working load	210 kg
Safe working load lifting receiver	75 kg
Safe working load infusion pillar	2 kg per clamp

Battery	Type 2x24 V Block battery (lead-gel), 3,3 Ah

Manual control unit	Völker
Double drive unit Okimat 480 for back section + upper leg +	Okin
lower leg section	Okin, single drive
Lifting gear motor	Okin
Charger (central shaped plug / CE 7/XVII)	IL24V500
Input	230 V , 110 V ; 180 mA
Nominal frequency	50 – 60 Hz
Output	U_o= 29 V, I_{max}=700 mA
Fuse	500 mA
Manufacturer:	Fa. Engelking

Temperature range, in operation	+ 10°C to + 40°C
Temperature range, in transport/storage	-20°C to +60°C
Relative humidity	30% to 75 %
Atmospheric pressure range	700 hPa to 1060 hPa

3.2 Classification

Protection against electric shock	Safety Category II or appliance with internal power source.
Type of protection by encasement according to EN 60259	IP X6 suitable for the use in wash plants.
Degree of protection of parts handled by users against electric shock according to DIN EN 60 601-1	Type B
Degree of protection against explosive materials and compounds	The bed is not explosion-protected and may not be used in environments in which there are flammable anaesthetics or cleaning agents (see leaflet ZH 1/200 of professional association.
MPG category	Class I
Service cycle	Interval 2 min / 10 min Operational time max. 2 min. Shut-off time 10 min.
Technical safety check	Once a year

4. Explanations for the nursing service

This documentation contains information that is required for the normal use of Völker hospital beds.
Völker does not accept any warranty claims for damages, injuries or accidents which are based on negligence, carelessness or improper use. Culpability is of no importance here. (see also 1.2).
A basic introduction of the nursing staff into the operation of the bed takes place by Völker or their representatives as required by the customer.
Participation in such a training by the nursing staff can be certified using a form designed for this purpose, including the participant's name, date and signature which are confirmed by Völker.
The safety regulations contained in this documentation (especially in chapter 2) must be adhered to.
Following the described behaviour patterns will ensure the safety of staff and patient.
Functions designated as optional extras are available only with the correspondingly equipped beds.

5. General operating instructions

5.1 Power-on time

Maximum power-on time of the electromotive bed function is indicated on the bed (identification plate) or the technical data sheet with Int 2 min/10 min, meaning that each bed function can be operated uninterruptedly within 10 minutes / 1 minute.

If the maximum power-on time of 1 minute is exceeded several times or for a longer time period, this may lead to a failure of the electromotive drive due to safety advices being released. The bed is then to be shut down for 10 minutes!

A time delay function is integrated into the bed in order to prevent continously changing button operations and movement operations by unintentionally touching a button for a short time. The operator must intentionally press and hold the function button. The bed function is then carried out with a time delay of 0.5 seconds.

5.2 Batteries

The batteries in the bed have an electric charge capacity which is equivalent to an operation of 4 lift and lying space adjustments with a work load of 210 kg. After that, the emergency functions (Trendelenburg/Antitrendelenburg) can still be carried out.

If the bed is positioned at its location without connecting the battery charger to it, energy consumption and self-discharge will lead to the discharge of the battery!
If batteries are totally discharged, they may be damaged to such a degree that early replacement becomes necessary!
In order to achieve a long battery life, proper handling of batteries and battery charger is absolutely necessary!

5.3 Safety device

The bed is provided with an electronic safety device preventing the drives from being overloaded. In case of an overload occurring, the bed will be automatically switched off.

5.4 Putting the bed into operation

Installation conditions
The bed is approved for the operation in dry rooms only (Technical Data Sheet). In order for the bed to be operated, a power supply and potential outlet, if necessary, is required in the location where the bed is installed.

The bed is mobile without auxiliary transport facilities.

The bed can be moved on solid grounds only. It is not permissible to drive the bed on uneven surfaces greater than 2 cm. The maximum carriageway's angle of inclination may be 10°.

The bed is delivered in complete condition and installed without dismantling transport devices.

5.5 Mechanical start-up

The provided head and foot parts have to be inserted into the corner joints of the bed frame.

5.6 Connecting the manual control unit

The manual control units have to be inserted into the provided jacks and to be screwed on.

In case of improper connection, wash plant capability cannot be guaranteed.

If the manual control unit is removed from the bed, the connection socket must be closed using the protective cap (in order to ensure safety level according to IP-X5 or IP-X6).

5.7 Applying the bed's brake

After each initial start-up or renewed start-up, the bed may be in a condition where the brake is not applied.
Operate the brake bow in order to apply the brake:
45° downward position to the bed's end – fully applied brake.

5.8 Electric start-up

(Charger : Engelking)

Connect the battery charger to the power supply (230V~ / 50 Hz).

Risk of injury! Do not place the battery charger above patient's head as plug can be pulled out of socket by exerting tension on spiral cable!

Wall-mounted battery chargers are to be fixed on to the wall and the cable connected to the mains power supply (socket) before the bed in put into service for the first time.

It is absolutely essential to protect the charger against moisture-penetration. This can endanger patients and/or other persons.

5.9 Connecting the charger to the bed

To do this, insert the charger plug (spiral cable) into the connecting cable socket on the central bearer of the bed.

Make sure the plug is fully inserted by checking that there is no free space between the coupler and the plug. If the connection is faulty, the battery will not charge!

The following states are indicated on the handle of the personnel keyboard:

RED	Not ready, only emergency functions are available.
GREEN (flashing)	Battery is chargen when the bed is connected via the power supply unit.
GREEN	Battery is fully charged or bed is fully operational and power supply not connected.
All LEDs are off	Bed is in "Sleep mode" – however, it is fully operational as soon a button is pressed.

1. Checking condition of battery

2. Unlocking the bed

3. In order to put the manual control unit and the personnel keyboard into operation after switching on the bed, the locking of the function keys must be released.

4. Performance control

5. ➔Bed is now ready for use.

5.10 Operating the assist rails

In order to set up an assist rail part, pull the assist rail horizontally to the side as far as it will go and fold it up.
In order to adjust the height of the assist rail, pull the telescopical part upward as far as it will go.



In order to completely fold down an assist rail part, press both buttons on the exterior surface of the frame, right above the cross bar, so that the height-adjustable guard part can be put into its lowest position.
Operate the release button labelled “Push” at the bottom of the assist rail part and tilt it horizontally to the side so that it runs parallel to the floor.
Push the assist rail completely under the lying surface.
One or more assist rail parts can be inserted as required in order to safeguard the bed user.

Folding up all the four assist rails provides the user of the bed with maximum protection.

Because of their exceptional stability, the assist rail parts can also be used to deposit bed linen (maximum 15 kg) or as an additional support surface for clinically desired bearings as, for example, carrying out physiotherapeutic treatment.

Warning: All people who are responsible for handling the assist rails must read and comply with the following information:

When operating the back, upper leg or lower leg adjustment, the lift or assist rails, it is vital to ensure that the patient neither gets into contact with the assist rail nor any part of the body is jutting out the assist rail.

If assist rails are used for a child or a person whose mental condition appears to make it necessary to use such a device, it has to be ensured that the manual control unit is stored beyond their reach. If the manual control unit is installed in a place where the patient can reach it, an exact healthcare documentation must be kept according to the rules (it must always be taken care of that no health hazards may occur).

Protection covers for the assist rails are available as an accessory, providing additional protection against injuries through the contact with assist rails. It is recommended to use these protection covers with all persons where there is a high risk of injuries caused by unavoidable contacts with the assist rails. This, however, does not relieve the caregiver or patient from exercising reasonable care when operating the bed.

When using assist rails, they must either be always led completely upward, so they will click into place, or be put into bottom location as far as they will go.

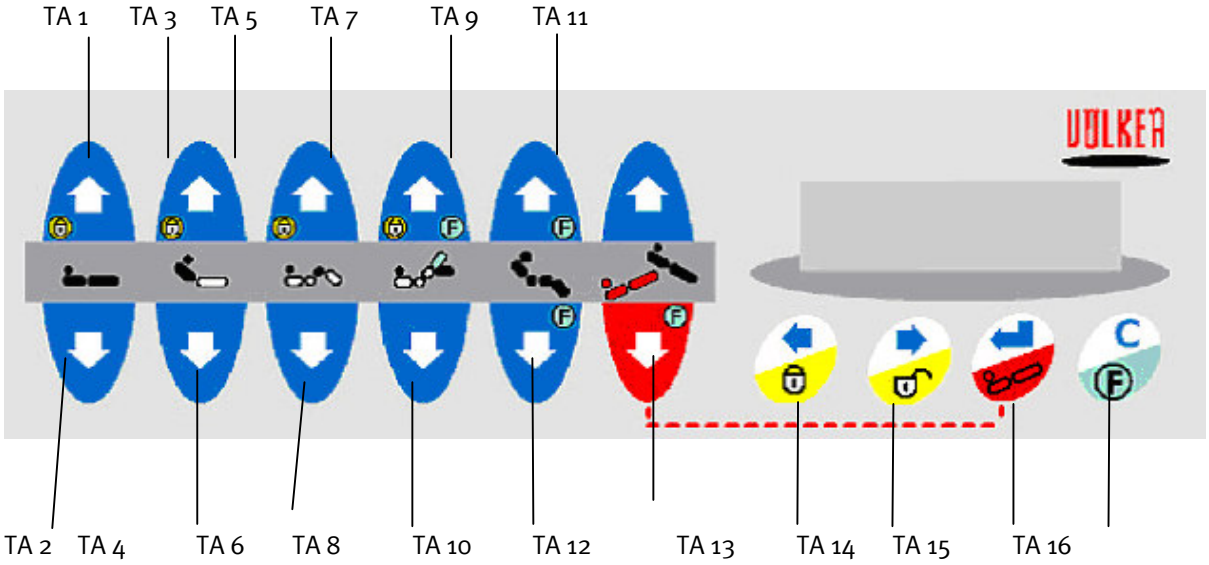
The assist rails should always be held at the respective section ends using both hands and guided to the top/bottom.

5.11 Life expectancy / disposal

The average life expectancy of the hospital bed is approx. 10 years. To guarantee an environment-friendly disposal after putting the bed out of service, please contact your representative-in-charge.

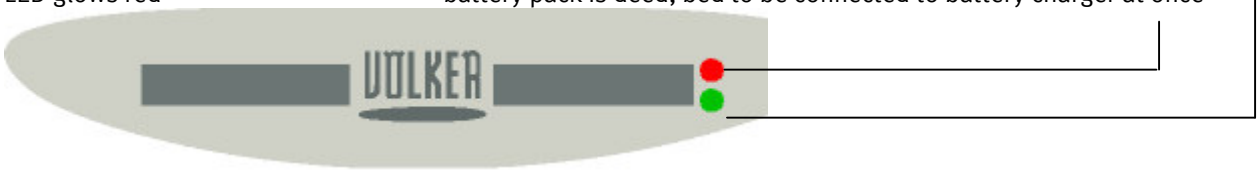
6. Control functions

6.1 Overview – Operation by means of personnel keyboard



Motional keys 1 + 2:	height adjustment UP/DOWN
Motional keys 3 + 4:	back section UP/DOWN
Motional keys 5 + 6:	upper leg section UP/DOWN
Motional keys 7 + 8:	lower leg section UP/DOWN
Motional key 9:	cardiac chair position
Motional key 10:	basic position
Motional key 11:	reverse Trendelenburg (foot end of mattress-frame downwards)
Motional key 12:	tilt to horizontal position from reverse Trendelenburg position
Menu key 13:	deactivation (padlock) of motional keys with yellow dot
Menu key 14:	reactivation (padlock crossed out) when operating one of the motional keys with yellow dot
Motional key 12 + menu key 15:	Trendelenburg (head end of mattress-framework downwards)
Menu key 15:	enter
Menu key 16:	function key/cancel
LED glows green	bed is ready for operation
LED flashes green	bed is booted
LED glows red	battery pack is deed, bed to be connected to battery charger at once

Note:
menu key display control



6.2 Manual functions

Motional keys 1 to 11. Pressing more than one key causes all operations to stop. This makes it impossible to carry out several functions simultaneously.

An exception is automatic functions (marked F) which can also be carried out manually.

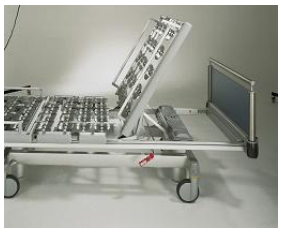
The current position of the bed is shown in the display during carrying out of adjustment functions. Limitations of travel can be altered in the menu. (see chapter 6.5.4).

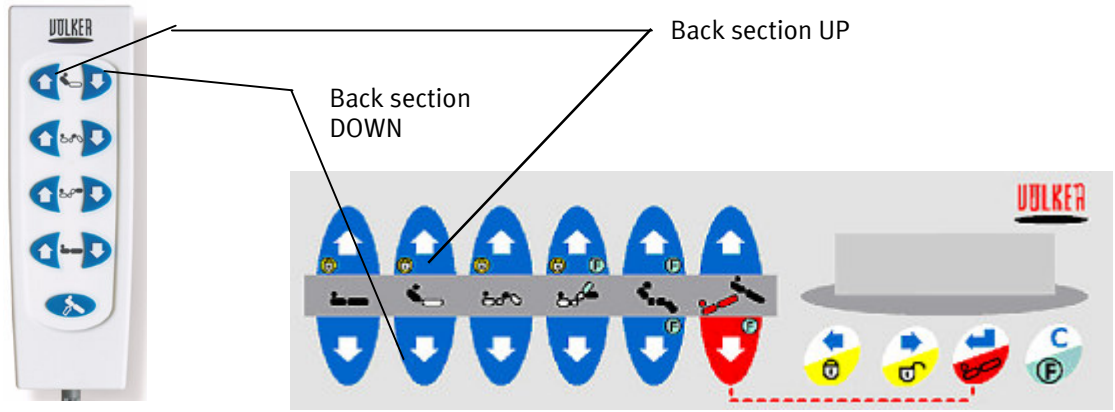
When a menu key (13 – 16) is operated, the current position of the bed is shown in the display, although no movement is taking place.

6.3 Electrical functions

6.3.1 Back section adjustment

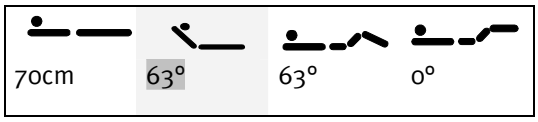
The back section can be adjusted by means of the manual control unit or the personnel keyboard.



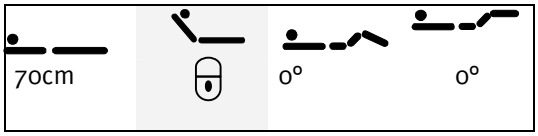


If necessary, unlock the back section using the personnel keyboard.

The back section's angle of tilt is shown in degrees in the display.



If the function is deactivated, a padlock symbol is shown instead of the angle of tilt.



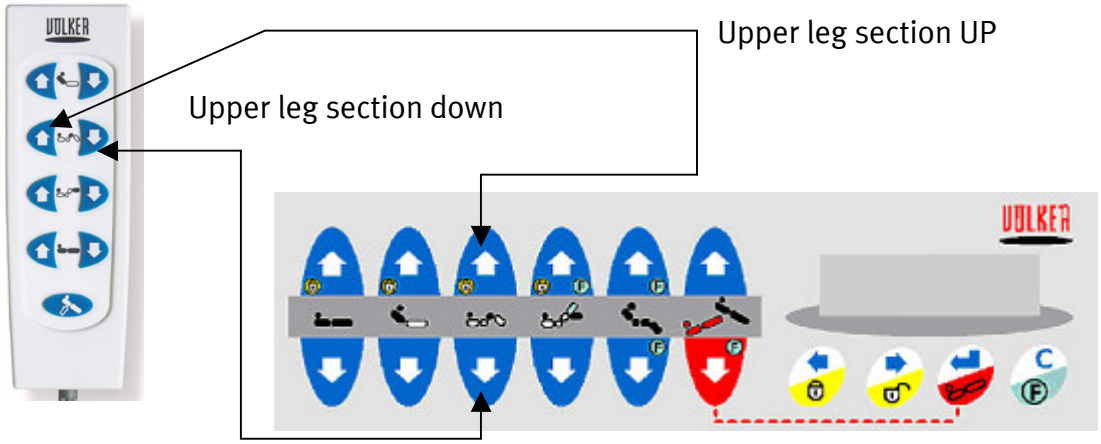
The back section of the lying surface can be folded up to an angle of tilt of up to 70 degrees.
For safety reasons, the movement of the back section is coupled with that of the upper leg section (minimum aperture angle 90°) to prevent the entrapment of patients. In the case of raised or deactivated upper leg sections, the maximum angle of elevation of the back section can be limited.

When the back section is raised, it will be displaced by a maximum of 150 mm towards the headboard. This way, the lying comfort is increased, since the patient is stopped from sliding down the bed.

Warning: When the back section is raised, with the assist rails being folded up, it has to be ensured that neither parts of the patient's nor any other person's body protect from or lie on the assist rail!

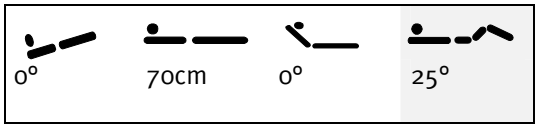
6.3.2 Upper leg section adjustment

The back section lying surface can be adjusted by means of the manual control unit or the personnel keyboard.
The corresponding buttons are as follows:

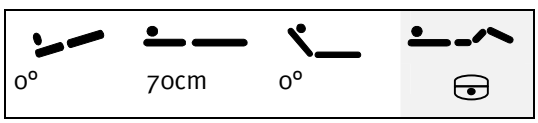


If necessary, unlock the back section using the personnel keyboard.

The upper leg section's angle of tilt is shown in degrees in the display.



If the function is deactivated, a padlock symbol is shown instead of the angle of tilt.



The upper leg section of the lying surface can be folded up to an angle of tilt of up to 85 degrees.

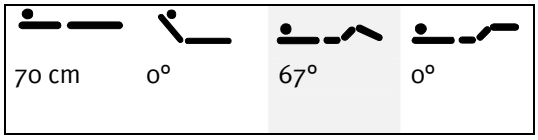
For safety reasons, the movement of the back section is coupled with that of the upper leg section (minimum aperture angle 90°) to prevent the entrapment of patients. In the case

of raised or deactivated back sections, the maximum angle of elevation of the upper leg section can be limited.

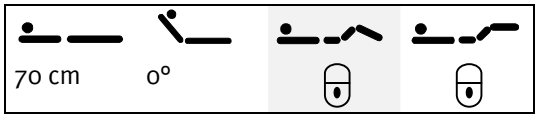
Warning: When the upper leg section is raised, with the assist rails being folded up, it has to be ensured that neither parts of the patient's nor any other person's body protect from or lie on the assist rail!

If the optional automatic adjustment of the lower leg section is available, the following display is shown.

The upper leg section's angle of tilt is shown in degrees in the display.



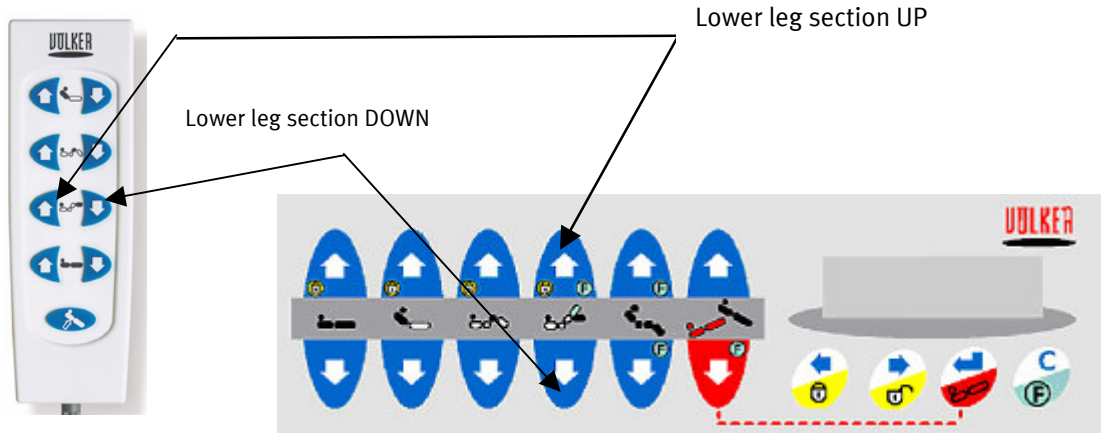
If the function is deactivated, a padlock symbol is shown instead of the angle of tilt.



If an angle for the lying surface is set instead of a parallel height adjustment, the tipping angle is shown instead of the height.

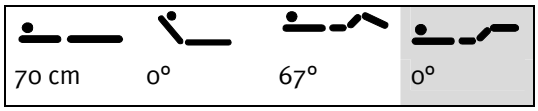
6.3.3 Lower leg section adjustment / cascade bed positioning


If the bed is equipped with the optional automatic adjustment function, the lying surface of the lower leg section can be adjusted using the manual control unit or the personnel keyboard.

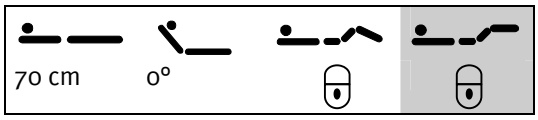


In necessary, cancel deactivation of the lower leg section on the personnel keyboard.

The lower leg section's angle of tilt is shown in degrees in the display.



If the function is deactivated, a padlock symbol is shown instead of the angle of tilt.



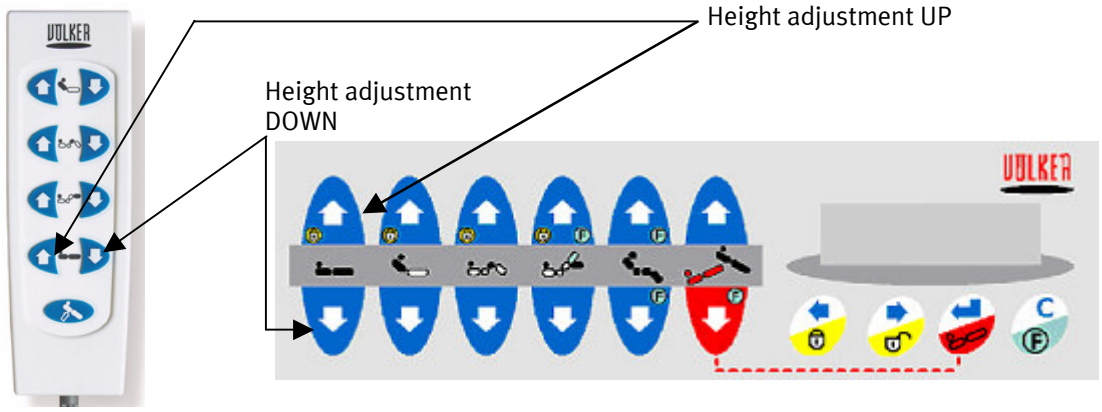
The angle of elevation of the lower leg section is shown in relation to the flat lying surface. For safety reasons, the movement of the lower leg section is coupled with that of the upper leg section to prevent the entrapment of patients (prevention of leg overstretching).

Warning: When the lower leg section is raised, with the assist rails being folded up, it has to be ensured that neither parts of the patient's nor any other person's body protect from or lie on the assist rail!

Warning: When raising the leg sections, with the assist rail being folded up, it has to ensured that the patient neither gets into contact with the assist rails nor his or any other person's parts of the body project from the assist rail!

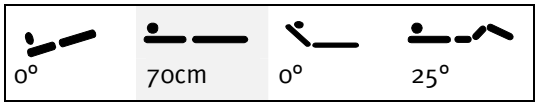
6.3.4 Bed height adjustment

The entire lying surface can be adjusted by means of the manual control unit or the personnel keyboard. The corresponding buttons are as follows:

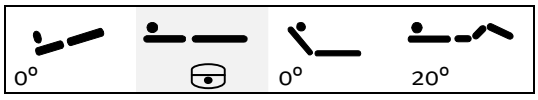


If necessary, unlock the height adjustment using the personnel keyboard.

The height of the mattress-frame above the floor is shown in the display in cm:

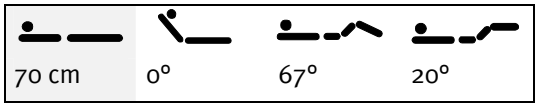


If the function is deactivated, a padlock symbol is shown instead of the height.

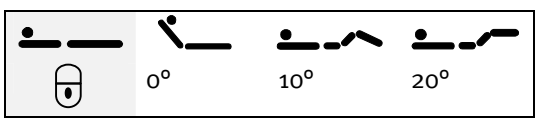


If the optional automatic adjustment of the lower leg section is not available, the following display is shown:

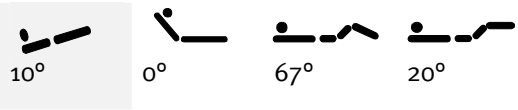
The height of the mattress-frame above the floor is shown in the display in cm.



If the function is deactivated, a padlock symbol is shown instead of the height.



If an angle for the lying surface is set instead of a parallel height adjustment, the tipping angle is shown instead of the height.

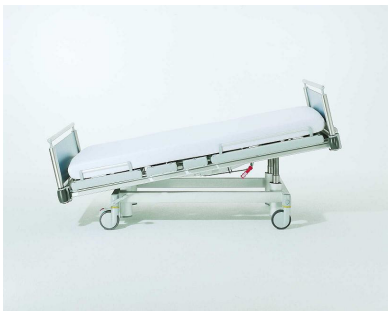


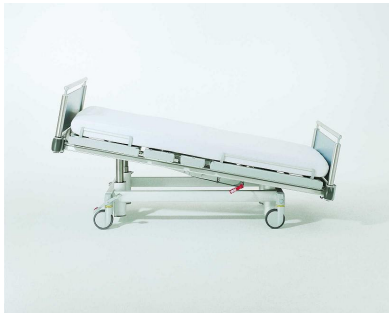
Warning: We recommend to lower the bed as far as it will go in order to prevent the patient from any danger caused by falling out of the bed!

Warning: Before lowering the bed, it must be ensured that no persons, limbs or bed linen are between the lying surface and the undercarriage. Before any one gets into and out of the bed, it has to be ensured that the bed stands firmly on the ground (castors in parked position)!

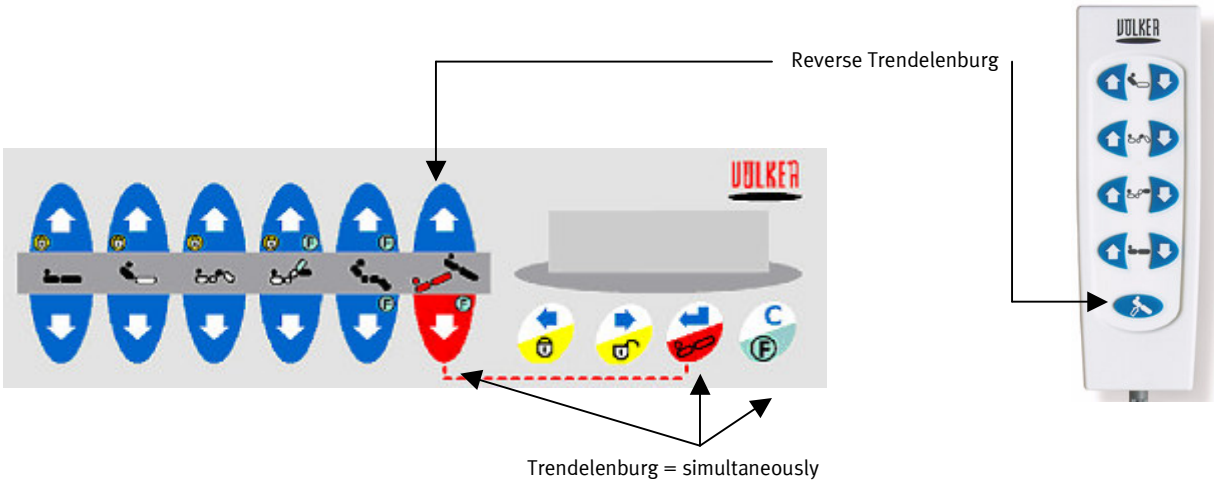
Warning: When the height adjustment is operated, with the assist rail being folded up, it has to ensured that the patient neither gets into contact with the assist rails nor his or any other person's parts of the body project from the assist rail!

6.3.5 Trendelenburg-/Reverse Trendelenburg positioning





The Trendelenburg/Reverse Trendelenburg positions can only be set by means of the personnel keyboard.
The corresponding buttons are as follows:



NOTE: If the key with the Trendelenburg symbol is pressed only, the bed will move from the reverse Trendelenburg position into the horizontal position.

In case an error occurs with the lifting function or the battery is completely dead, the Trendelenburg function cannot be carried out any more. If necessary, the patient must then be moved to another bed!
As long as the batteries have a residual voltage, the function will still be available independent of what is shown in the display.

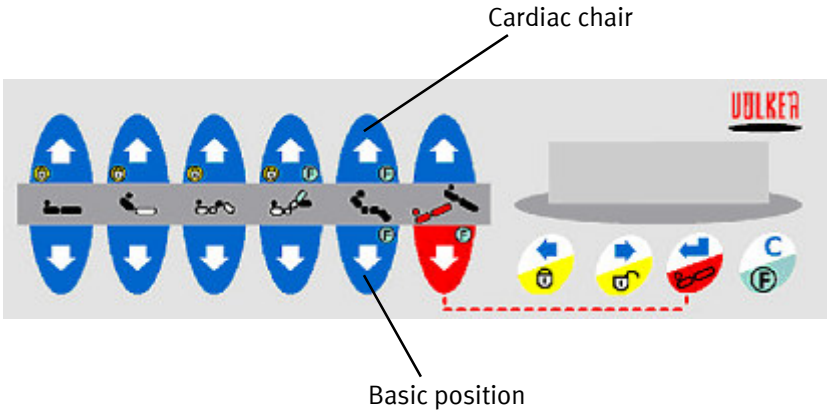
After locking the lifting function, the Trendelenburg/reverse Trendelenburg function will not be locked!

6.3.6 Sitting position (cardiac)

with simultaneous operation of reverse Trendelenburg function

Only to be carried out by qualified professionals!

The cardiac chair function can only be set by means of the personnel keyboard.
The corresponding buttons are as follows:

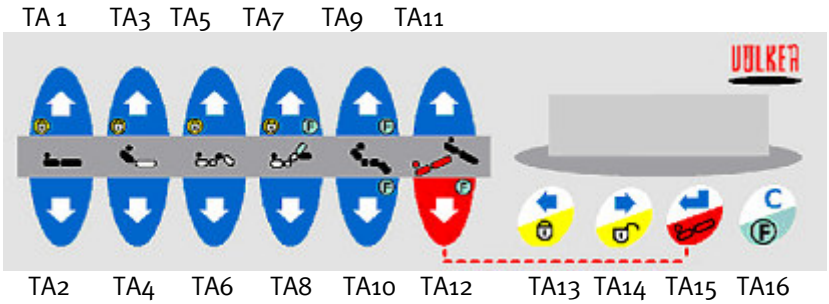


The following is shown in the display:

To reinstate basic position, press the button below the “Cardiac chair” key until bed height has returned to basic position.

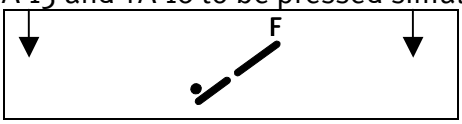
6.4 Automatic functions

6.4.1 Automatic medical functions

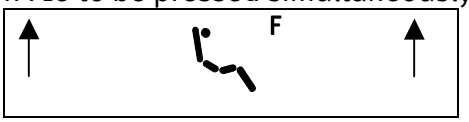


In order to facilitate the work with patients, functions have been installed for the nursing staff enabling them to drive the bed into preset positions without having to press and continously hold a key.
Except for the transport function, automatic medical functions are marked with an “F” in the keyboard layout, while other functions can be carried out by using the following key combinations.

Trendelenburg keys TA 12, TA 15 and TA 16 to be pressed simultaneously.

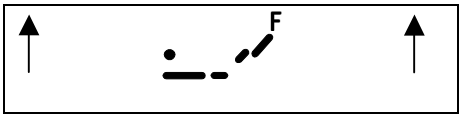


Cardiac chair keys TA 9 and TA 16 to be pressed simultaneously.



Basic position keys TA 10 and TA 16 to be pressed simultaneously.

Shock position (possible only with optional foot motor): Keys TA 7 and TA 16 to be pressed simultaneously.



Release the keys and the bed goes into the required position automatically.
If functions are deactivated, then automatic functions are also deactivated, including the automatic Trendelenburg travel.

All automatic functions can be stopped by pressing any key on the personnel keyboard or the manual control unit!
When using automatic functions, carers must remain at the bedside to ensure the safety of patients.

6.4.2 Hidden automatic medical functions

1. Transport position [jack 70 cm, lying surface remains unchanged]

Position used for moving patients to a treatment, for example, so that a normal door-frame can be passed with the lift-up device inserted.
Simultaneously press the keys TA 3, TA 4 and TA 16.

AUTOMATIC FUNCTION TRANSPORT

2. Reanimation position [jack 60 cm, lying surface flat]

Position used for reanimation procedures with patients lying in the bed.
Simultaneously press the keys TA 1 and TA16.

AUTOMATIC FUNCTION REANIMATION

6.4.3 Automatic service functions:

1. Bed preparation [jack maximum height, lying surface flat]

Position used for preparing beds or putting clean sheets on the bed.

Simultaneously press the keys TA 4, TA 6 and TA 16.

AUTOMATIC FUNCTION BED PREPARATION

2. Manual cleaning [jack maximum height, lying surface max. raised]
Position used for cleaning beds manually.

Simultaneously press the keys TA 5, TA 6 and TA 16.

AUTOMATIC FUNCTION MANUAL CLEANING

3. Cleaning in washing plant [jack minimum height, lying surface max. raised]
Position used for cleaning beds in a washing plant.

Simultaneously press the keys TA 3, TA 5 and TA 16.

AUTOMATIC FUNCTION WASHING PLANT

6.5 Menu functions

The menu can be called up by pressing the keys TA14 and TA16 simultaneously.
You can move around the menu by pressing cursor keys TA13 and TA14. Press the enter key TA15 to select or confirm a menu function:
Press cursor keys as follows to alter values:

right (TA14) = increase value
left (TA12) = decrease value

This is only possible, however, if the value has been previously selected by pressing the ENTER key (TA15) and the cursor is positioned beneath the value.

Press the ENTER key to complete an alteration in value.

Leaving the menu:

Menu BACK + TA15 or TA16 in the menu

Information about PIN codes:

In order to avoid unauthorized alterations of settings, some menu items are secured by having to enter the right PIN code.
In order to carry out certain menu functions, the user is prompted to enter a PIN code. The Carers' PIN code must then be entered to get to the next menu level, for example the menu item "limitation of travel":

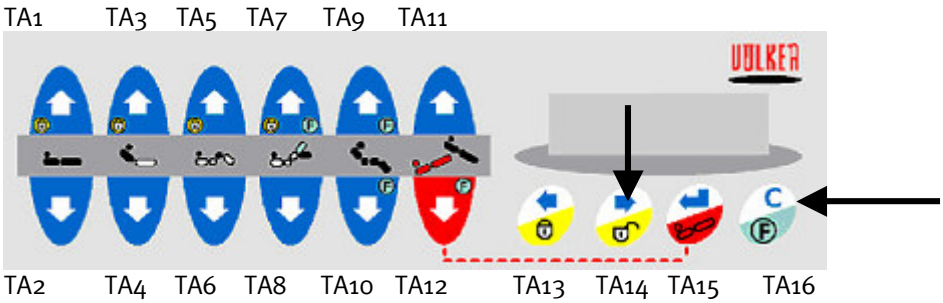
CARERS' PIN code: TA12, TA2, TA6, TA10

In some menu items, a technicians' PIN has to be entered. In those cases, the user is not prompted to enter a PIN in order to prevent unauthorized persons from trying to get access to those functions. Entering the technicians' PIN code will switch from display mode to alteration mode and has thus to be carried out from within the display mode. Menu items where alterations can be made by means of the technicians' PIN code are "Automatic mode, Last technical check and manual control unit comfort key".

TECHNICIANS' PIN code: TA6, TA9, TA5, TA10

Note: The key names also remain the same if the automatic drive for the lower leg section is not available. The keys TA7 and TA8 will then be omitted.
Values that have been changed are marked by an "asterisk" on the top right edge.
In alteration mode, the value to be altered is preceded by the "⇢" sign.

6.5.1 Deactivating the manual control unit in the menu



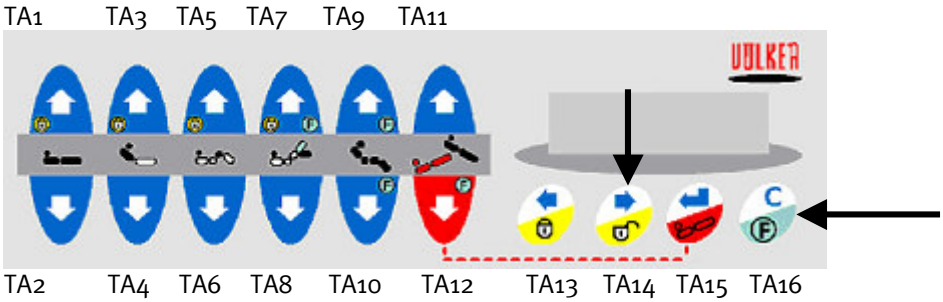
The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu
Manual control unit

When operating the key TA15, the status is shown. By operating the key TA15 again, you will activate the alteration mode. By pressing the keys TA13 or TA14, the value can be altered. By pressing the key TA15, the altered value is accepted and a leap is carried out to the starting menu item.

Manual control unit
⇢ ON

6.5.2 Menu function “Bed data”



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu
Manual control unit

By pressing the key TA14, you will move to the menu item “Bed data”.

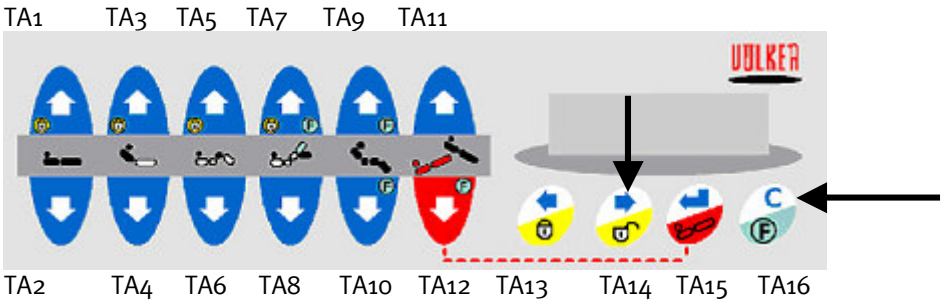
Menu
BED DATA

By pressing the key TA15, you will move to the bed data display menu. When pressing the key TA14 twice in succession, the following data will be shown:

Bed identification number
Inventory number
PT-SW-Version — Software version of personnel keyboard
PT-HW-Version — Hardware version of personnel keyboard

This is a display menu only – alterations cannot be made here.

6.5.3 Menu function "Limitation of travel"



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until "Menu" appears in the first line of the display.

Menu Manual control unit

By pressing the key TA14 twice, you will move to the menu item "Limitation of travel".

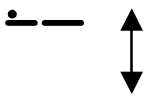
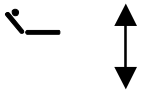
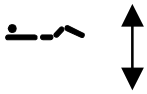
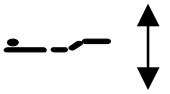
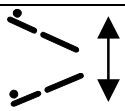
Menu Limitation of travel

When pressing the key TA15 twice in succession, you will move to the display of the limitation of travel set. Using the keys TA13 and TA14, you can get to the display of the various drives. Pressing the key TA15 from within the display will switch to the alteration mode. Then it will appear the prompt for entering the CARERS' PIN code: TA12, TA2, TA6, TA10 .
If this PIN code is keyed in, you will move to the alteration mode. Altering a value takes place by pressing the keys TA13 or TA14:
The value preceded by the "⇢" sign is altered. By pressing the key TA15, your selection will be confirmed and accepted. Having confirmed one value, you will move to the next value. All values are shown and can be altered. Finally, by pressing the key TA15, you will move back to the first menu level.
Example:

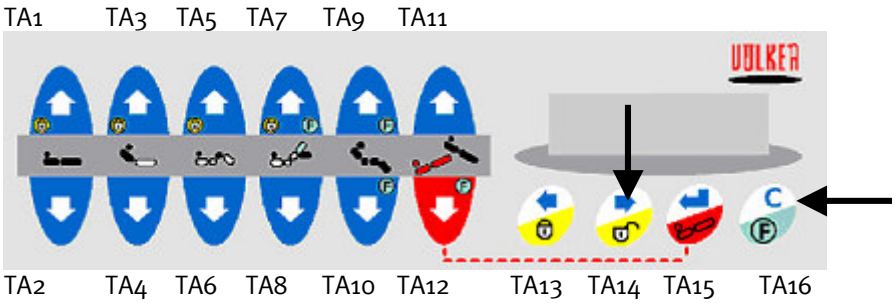
> 80cm ⇢ 40cm

Limitations of travel are always effective. Automatic functions are not carried out and "FUNCTION LIMITED" appears in the display.

6.5.4 Limitation of travel displays

Telescopic jack	80cm 40cm 
Back section	70° 0° 
Upper leg section	67° 0° 
Lower leg section	30° 0° 
Trendelenburg/reverse Trendelenburg	14° 14° 
Back without change	Menu

6.5.5 Menu function “Date”



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

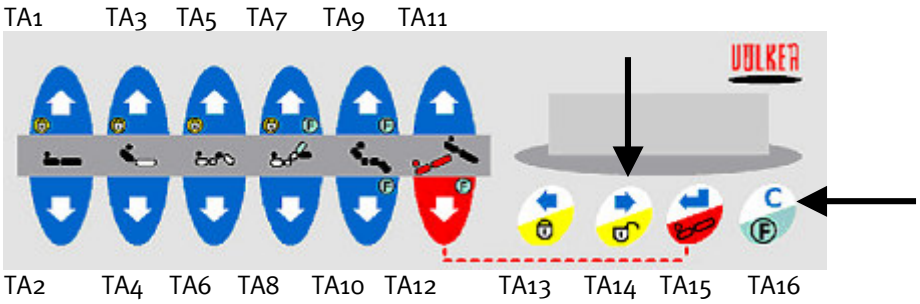
Menu
Manual operating unit

By pressing the key TA14 three times, you will move to the menu item “Date”.

Menu
DATE

By pressing the key TA15, you will move to the display of the date set. By pressing the key TA15 again, you will switch to the mode for changing the day. By pressing the key TA13 or TA14, you can alter the day setting which is accepted by pressing the key TA15. Then, the cursor will leap to the month setting. The MONTH and YEAR settings are altered analogously to the day setting. By confirming the year setting, you will move back to the first menu level.

6.5.6 Menu function “Time”



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

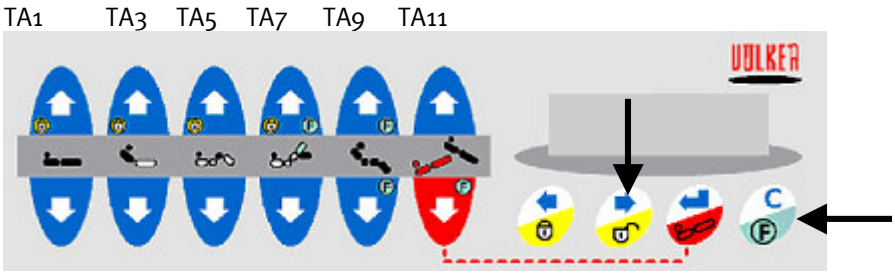
Menu
Manual control unit

By pressing the key TA14 four times, you will move to the menu item “TIME”.

Menu
TIME

By pressing the key TA15, you will move to the display of the time set. By pressing the key TA15 again, you will switch to the mode for altering the hours. By pressing the key TA13 or TA14, you can alter the time setting which is accepted by pressing the key TA15. Then, the cursor will leap to the hours setting. By confirming the minutes setting, you will move back to the first menu level.

6.5.7 Menu function “Language”



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu
Manual control unit

By pressing the key TA14 five times, you will move to the menu item “LANGUAGE”.

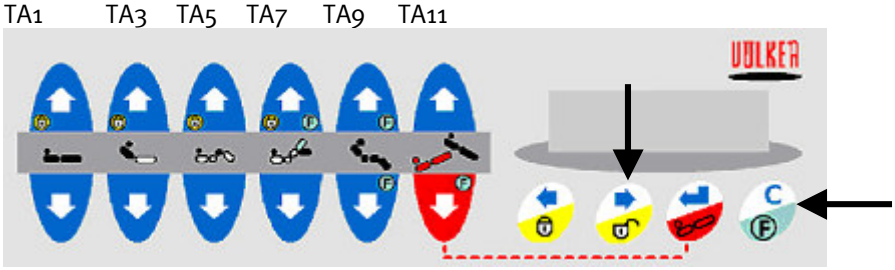
Menu
Language

By pressing the key TA15, you will switch to the display mode, and the language set will be shown. By pressing the key TA15 again, you will switch to the alteration mode. Using the keys TA13 or TA14, you can now set a different language. By pressing the key TA15, your selection will be accepted.

By pressing the key TA16, you can leave the menu and move back to the top menu level.

6.5.8 Menu function “Service”

TA1 TA3 TA5 TA7 TA9 TA11



TA2 TA4 TA6 TA8 TA10 TA12 TA13 TA14 TA15 TA16

The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu
Manual control unit

By pressing the key TA14 six times, you will move to the menu item “SERVICE”.

Menu
SERVICE

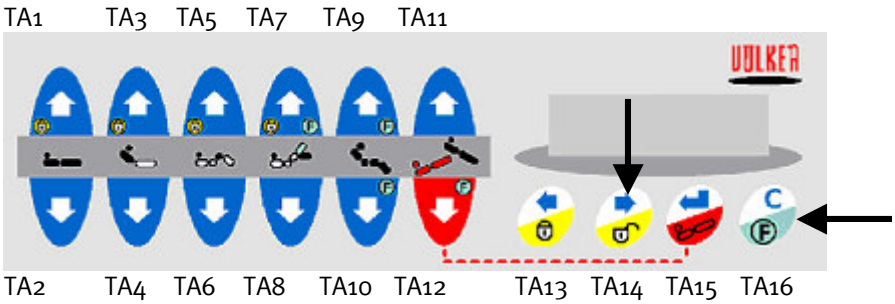
By pressing the key TA15 twice, you will move to the display of the following information:

Display	Meaning
Hospital bed S960/2002	Type of bed
ZEN SW-Version	Software version of head office
ZEN HW-Version	Hardware version of head office
ZEN Serien-Nr.	Serial number of head office
PT-SW-Version	Software version of personnel keyboard
PT-HW-Version	Hardware version of personnel keyboard
PT Serien-Nr.	Serial number of personnel keyboard

The menu item “wheel-adjustment” enables you to readjust the height adjustment when using other than the standard wheels.

Only technicians of Völker or persons who are assigned by Völker are allowed to use this menu item.

6.5.9 Menu function “Last technical check”



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu
Manual control unit

By pressing the key TA14 six times, you will move to the menu item “LAST TECHNICAL CHECK”.

Menu
LAST TECHNICAL CHECK

By pressing the key TA15, the value stored is shown. By pressing the key TA15 again, you will move back.
When entering the technicians’ PIN code while in display mode (see above), you will switch to the mode for altering the date.
After the PIN code is entered, the following display appears:

LAST TECHNICAL CHECK
today’s date

If the key TA15 is pressed twice while the above information is shown, the value will be accepted. If the key TA14 is pressed, the following display will be shown:

LAST TECHNICAL CHECK
change

By pressing the key TA15, you will switch into the editing mode.
By pressing the key TA13 or TA14, you can alter the day setting which is accepted by pressing the key TA15. Then, the cursor will leap to the month setting. The MONTH and YEAR settings are altered analogously to the day setting. By confirming the year setting, you will move back to the first menu level.

If, with the following display shown

LAST TECHNICAL CHECK change

the key TA14 is pressed again, the menu item for erasing the date will be shown:

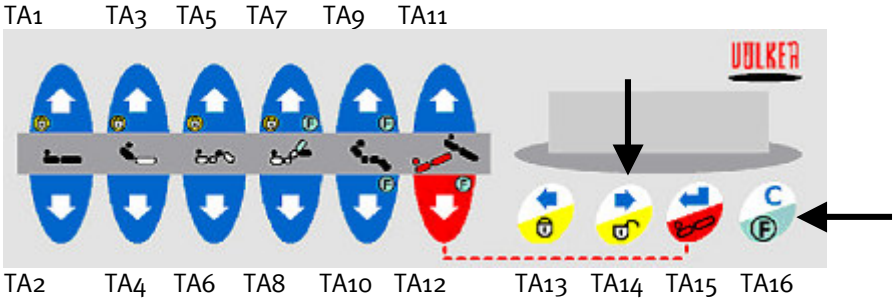
LAST TECHNICAL CHECK erase

If the key TA15 is pressed, the following display will appear

Erase > yes

By pressing the key TA13 or TA14, the value set can be changed to NO. By pressing the key TA15, the selected function will be carried out and accepted.

6.5.10 Menu function “Last cleaning”



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu Manual control unit

By pressing the key TA13 six times, you will move to the menu item “LAST CLEANING”.

Menu LAST CLEANING

By pressing the key TA15, the value stored is shown. By pressing the key TA15 again, you will move back.
If the key TA13 or TA14 is operated while in display mode, the prompt for keying in the carers’ code will appear. Once the PIN code has been entered, you will switch to the mode for altering the date.

After the PIN code is entered, the following display appears:

LAST cleaning today's date

If the key TA15 is pressed twice while the above information is shown, the value will be accepted. If the key TA14 is pressed, the following display will be shown:

LAST CLEANING change

By pressing the key TA15, you will switch into the editing mode.
By pressing the key TA13 or TA14, you can alter the date setting which is accepted by pressing the key TA15. Then, the cursor will leap to the month setting. The MONTH and YEAR settings are altered analogously to the day setting. By confirming the year setting, you will move back to the first menu level.

If, with the following display shown

LAST CLEANING change

the key TA14 is pressed again, the menu item for erasing the date will be shown:

LAST CLEANING erase

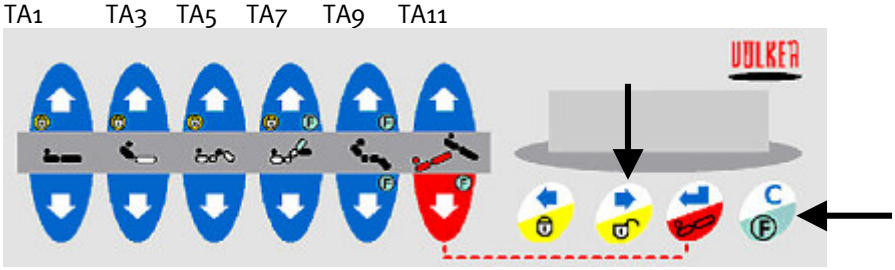
If the key TA15 is pressed, the following display will appear

Erase > yes

By pressing the key TA13 or TA14, the value set can be changed to NO. By pressing the key TA15, the selected function will be carried out and accepted.

6.5.11 Menu function “Automatic MED”

TA1 TA3 TA5 TA7 TA9 TA11



TA2 TA4 TA6 TA8 TA10 TA12 TA13 TA14 TA15 TA16

The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu
Manual control unit

By pressing the key TA14 eight times, you will move to the menu item “Automatic MED”. In this menu, the automatic medical functions can be deactivated of reinstated. By pressing the key TA15, you will access this menu item showing the current status:

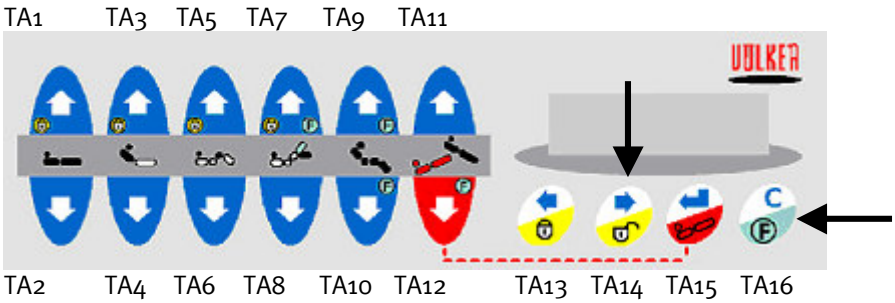
Automatic MED
deactivated

By pressing the key TA13 or TA14, the prompt for entering the carers’ PIN code appears: TA12, TA2, TA6, TA10

PIN code:
change

The selection of a PIN code can be confirmed by pressing the key TA15. The system is now in the alteration mode. You can make your selection by using the key TA13 or TA14 and have it confirmed by pressing the key TA15.

6.5.12 Menu function “Automatic Service”



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu
Manual control unit

By pressing the key TA14 nine times, you will move to the menu item “Automatic SERV”. In this menu, the automatic service functions can be deactivated or reinstated. By pressing the key TA15, you will access this menu item showing the current status:

Automatic SERV

Deactivation:
By pressing the alteration keys (TA13 or TA14), the prompt for keying in the PIN code appears: By entering the carers’ PIN code, the automatic service function can be deactivated.

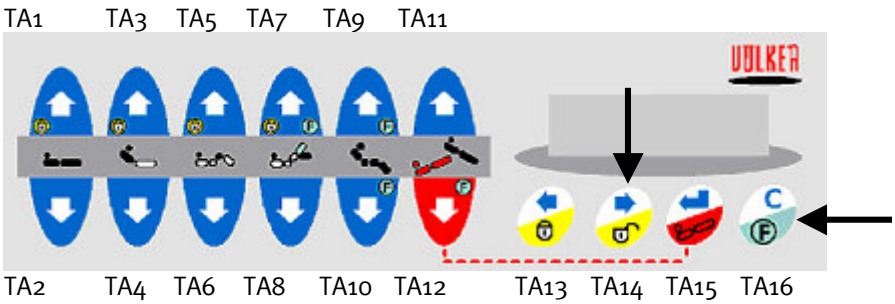
Automatic SERV
> DEACTIVATED

Using the key TA13 or TA14, you can change the setting and confirm it by pressing the key TA15.

Reinstatement:
As the automatic service functions are no medical functions, they can only be reinstated by a technicians’ PIN code. To do this, the technicians’ PIN code must be keyed in with the display mode being active. Then, the following alteration mode appears as follows:

Automatic SERV
CHANGE

6.5.13 Menu function “Comfort”



The menu is called up by simultaneously pressing the key TA14 (cursor right) and the function key TA16 until “Menu” appears in the first line of the display.

Menu
Manual control unit

By pressing the key TA14 ten times, you will move to the menu item “COMFORT”. In this menu, the COMFORT functions of the manual control unit can be deactivated or reinstated.

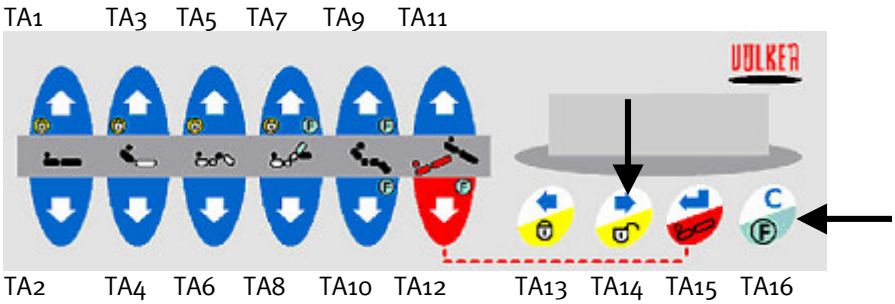
Menu
Comfort

By pressing the key TA15, you will access this menu item showing the current status:

COMFORT
deactivated

By pressing the key TA15 again, you will switch into the alteration mode.
By pressing the key TA13 or TA14, the current status can be altered. By pressing the key TA15, the selection set is accepted.

6.5.14 Reinstating ground level state (RESET)



By simultaneously pressing the keys TA13, TA14, TA15 and TA16, the bed is reinstated to ground level state. The word “RESET” appears in the display, and the background illumination of the display switches off.

After the RESET has been carried out, the normal menu appears in the display.

Attention: After each RESET, all movement levels, that is

- height adjustment
- back section lying surface
- upper leg section lying surface and
- lower leg section lying surface (if available)

must be moved to end-stop.

Attention:
During the RESET process, all deactivations are reinstated to the starting position.
Limitations of travel set remain active after reset.

6.6 Error messages from control

Control errors are shown in the display or indicated by giving acoustical signals. Most of the indicated errors are mere status displays which are internally logged and be overwritten by the next operation. They have no impact on the operation. If an error occurs several times, however, the information given in the display should be noted down and the VÖLKER after-sales service be informed.

Error message shown in the display	Error/problem	Corrective measure
INVALID CS	Check sum error	Next operation will cancel this error
INVALID PORT	Invalid parameter	Next operation will cancel this error
INVALID STATE	Invalid data range	Next operation will cancel this error
INVALID COMMAND	Invalid command	Next operation will cancel this error
INVALID LENGTH	Inconsistent data length	Next operation will cancel this error
INVALID DAY	Meaningless entry for the day, e.g. 33rd day of the month.	Enter a meaningful value
INVALID MONTH	Meaningless entry for the month, e.g. 13th month of the year.	Enter a meaningful value
INVALID TIME	The number of minutes is beyond a defined range	Enter a meaningful value
INVALID MINUTE	Meaningless entry for the minutes, e.g. 62nd minute of the hour.	Enter a meaningful value
INVALID HOUR	Meaningless entry for the hours, e.g. 25th hour of the day.	Enter a meaningful value
NOT IMPLEMENTED	Function not available	Enter a meaningful value
NOT SUPPORTED	Function not available	Next operation will cancel this error
NO MENU	No active menu available for the function selected	Next operation will cancel this error
NO DRAW FUNC.	Function not available	Next operation will cancel this error
REC OVERWRITE	New data cannot be processed before working off old data.	Next operation will cancel this error
TOO MANY KEYS	Too many keys were pressed	Next operation will cancel this error
No answer	Communication error between components	Next operation will cancel this error
Check sign displayed in top right corner	Communication error between components	Let keyboard get into “sleep mode” and wait about 15 sec. until it “refreshes”.
NO CALL BACK	No query by the personnel keyboard	Next operation will cancel this error
NO TIMER AVAIL.	Timer is overtaxed	Next operation will cancel this error
INVALID VALUE	Invalid values available	Next operation will cancel this error

Error message shown in the display	Error/problem	Corrective measure
Red LED in personnel keyboard glows, battery charge display 0%	One or both batteries are faulty.	Emergency functions, TRENDELENBURG AND REVERSE TRENDELENBURG will function until the batteries are fully dead; other operations cannot be performed. Call after-sales service.
No message except for the one indicating that CHARGE LED is not flashing	Temperature of batteries is either below 0°C or above 40°C.	The bed can be operated until the batteries are fully dead; the batteries are not charged.
SERVICE F1	Output value of battery temperature sensor is beyond the range of –30°C to +120°C.	Call after-sales service, because temperature sensor is defective.
SERVICE F2	No supply voltage available for the motors	Call after-sales service.
SERVICE F3	Problems when trying to read from or writing to EEPROM	Take patient out of the bed, confirm error message by pressing the RETURN KEY, perform RESET and move each drive to end-stop. The bed will then be operational again. If the sections are not brought into end-stop position, each drive which was not in end-stop position will remain deactivated.
SERVICE F4	Overcurrent or 24 V monitoring	Call after-sales service.
Background illumination of display is off; no indication, no movement	Central check sum error; bed is switched off.	Call after-sales service.
Motors do not rotate after request by manual control unit or personnel keyboard.	Timeout by max. power-on time of 2 min. or repeated try to run a blocked drive.	Wait 10 minutes and try again. If the drive can still not be run, perform RESET.
NO CALIBRATION	Calibration is missing	Call after-sales service.
SERVICE F4	MOTOR VOLTAGE ON WITHOUT REQUEST/INVALID MOVEMENT Signal transmitter impulses missing	Call after-sales service.

7. Fault finding

The following table contains notes on potential malfunctions. The causes for such failures may be improper use or wear and tear. These malfunctions may lead to injuries of patients and staff.

Before carrying out any fault finding ensure that the battery is fully charged (POWER LED on personnel keyboard illuminates green) and the bed is connected to the mains supply (power plug inserted to an outlet which is live).
Before starting any repair work make sure to disconnect the bed from the mains supply and to separate the battery pack from the circuit, if necessary.

Diagnosis	Possible cause	Trouble shooting
No functions can be executed on the bed and battery LED on the personnel keyboard is off.	Battery is fully discharged. Keyboard is defective.	(1) Battery. (2) Replace keyboard: Call customer service.
No functions can be executed on the bed and Power LED illuminates red.	Battery performance is not sufficient.	Battery must be charged (for at least 3.5 hours). Connect battery charger.
Raise/Lower function of the lying surface back section is faulty; back section does not move.	CPR function was not properly executed. CPR carrier bolt does not lock into position any more; motor rotates in idle run. Motor is defective (gears). After the CPR function was released, the RT drive did not reach the limit switch.	(1+2) Operate CPR lever lower back section as far as it will go. See instructions for use. (3) Raise the back section while simultaneously pushing it downward. (4) Check mechanical CPR unlocking, if necessary. (5) Replace motor. (6) Drive down electric RT until 0° is shown.
Raise/Lower function of the lying surface of lift function is faulty. Depending on the direction, movement takes place only a short way.	Control unit does not receive count impulses from the magnet sensor, sensor defective, cable disconnected.	(1) Perform reset and drive bed to its lowest position (2) Replace motor.
Raise/Lower function of the lying surface back section or upper leg section is defective; part moves only a short way and then stops. “F4” is shown in the display.	Part was overcharged.	(1) Release load towards corresponding drive and move it to opposite direction. (2) Check if the drive moves too heavy.
Raise/Lower function of lying surface adjustments is defective.	Function is locked. Motor is defective (gears).	(1) Unlock the function. (2) Replace the motor.
Raise/Lower function of lifting function is defective. The bed moves to a slanting position.	Control unit does not receive count impulses from the magnet sensor, sensor defective, cable disconnected. Limit switch is faulty. Toothed belt is torn or loose.	(1) Perform reset and drive bed to its lowest position (2) Replace the motor.
Hospital bed is hard to move.	Brakes are not properly disengaged. Castor is faulty Surface is not suitable	(1) Put the brake bow into the proper position. (2) Replace the castor. (3) Please note that more effort is required to move the bed on fitted carpets etc.

Diagnosis	Possible cause	Trouble shooting
Braking action missing on castor / castor makes noise.	Castor is faulty Brake bow is not in proper position	Replace castor. (2) Put the brake bow into the right position.
Directional locking effect missing at straight-on castor.	Castor is faulty Brake bow not properly set.	(1) Replace the castor.
Lying surfaces are not stable.	Sitting part connection is loose. Joint connection between sitting part lying surface and foot is defective. Up lever/mattress compensator at lying surface back section is faulty.	(1) Check screw connection at center support. (2) Check joint connection. (3) Up lever/mattress compensator at the lying surface back section.
Locking of lateral grids does not work.	Locking is faulty or dirty.	(1) Clean and lubricate locking device. (2) Replace lateral grid.
Bed cannot be moved straight on.	Brake bow is not properly locked. Directional blocking of castor is faulty.	(1) Put the brake bow into the right position. (2) Replace the castor.
Noise in mattress compensator.	Surface impact by disinfectant.	(1) Spray using PTFE (Teflon®) spray additive. Remove excessive lubricant.

8. Spare parts

Please take the name as well as the order number of the required component from the chapter “Presentation of Assemblies” in your service manual.

9. Cleaning and disinfection

9.1 Wipe and spray disinfection

The disinfection cleaners specified in the DGHM (German Association for Hygiene and Microbiology) list dated 01 July 1994 can be used in concentrations in accordance with the requirements as wipe and spray disinfection. The thinning ratio recommended in the respective instructions for use must be applied.
Solvents are not permitted.
Abrasives, scrubbing sponges or other substances making the surface blunt must not be used.

Organic solvents, such as halogenated/aromatised hydrocarbons and ketones, must not be used.

Following instructions have to be followed with regard to detergents and disinfectants:

The decontamination solutions in prescribed solution concentrations must not exceed or fall short of the ph value ranging between 6 and 8.
They must not contain corrosive of caustic matter.
They must not contain substances which modify the surface structure or the attachment features of the materials.
Lubricants must not corrode.
Water must not exceed a total water hardness of 0.9 mmol/l (up to 5 degrees d).

(Completely demineralized water must not be used).

Chlorides	< 100 ppm
Silicates as Sio2	< 15 ppm
Iron	< 0.05 ppm
Manganese	< 0.01 ppm
Copper	< 0.05 ppm

These indications are based on our current knowledge and experiences. They do not release the user from carrying out their own examinations and tests, because the conditions (e.g. water hardness) may vary locally. A legally binding pledge for certain features cannot be derived from this.

If unsuitable washing powder or disinfectants are used or used in incorrect mixing ratio or in case of insufficient maintenance, there might occur damages to the surface coating of beds for which we do not take responsibility.

Electric shock / fire hazards and functional deficiency
Generally, the bed has to be cleaned and disinfected, with the battery charger disconnected from the bed.
The plug and socket of the manual control unit are waterproof only if they are in plugged-in condition. If the plug is taken off, both units are not waterproof so that the plug has to be protected against penetrating water. The socket must be closed

using the cap.

9.2 Battery charger

The battery charger must always be disconnected from the mains supply before it is cleaned and disinfected.

The battery charger has to be used in dry rooms only. Moisture must in no case get into the battery charger. If cleaning or disinfection should take place using a damp cloth, the battery charger may be reconnected to the mains only when it is completely dry.

9.3 Spray lances

Cleaning and disinfecting the bed using spray lances of high-pressure cleaning apparatuses is not permitted.

9.4 Mechanical decontamination

During mechanical decontamination please pay attention to the following guidelines :

the temperature may not exceed 65° C
the pressure on the final nozzle may not exceed 6 bar

The wipe disinfectants listed in the DGHM 01.07.1994 (Deutsche Gesellschaft für Hygiene und Mikrobiologie="German Society for Hygiene and Microbiology") and can be used in the concentrations recommended in the relevant manufacturers instructions.

10. Accessoires

Völker supplies an extensive range of easy-to-fit accessories to achieve the greatest possible flexibility. The hospital beds are equipped with holding fixtures for accessories like drip-feed holders, grab-handles or bed lamps so that you can extend the functional scope of your bed.
In addition mattresses, lamps as well as an extensive programme of bedside cabinets and servers, tables, chairs, easy chairs and cupboards are available to match Völker hospital beds. Please ask for our information brochures.

10.1 Mattresses

To minimize the risk of injuries please only use matresses of the following size. If you are not using a mattress of Völker please contact your local specialised dealer.

Size of mattress	Size of mattress frame
88.5 x 200 x 12 cm	90 x 200 cm
88.5 x 220 x 12 cm	90 x 220 cm
98 x 200 x 12 cm	100 x 200 cm
98 x 220 x 12 cm	100 x 220 cm

10.2. Usage of fixation systems

The use of fixation systems like belts is only allowed in observance of the regulations of the producer.
When using fixation systems the safety frames must be completely raised.

It is not allowed to move the mattress frame during a fixation.
The mattress frame have to be in the lowest possible position.
Deactivate all functions of the mattress frame during a fixation and keep the manual control unit out of range of the patient

11. List of tools

Ring spanner WS 17, WS 13
Open-end spanner WS 13, WS 10
Set of angled screw drivers
Set of Torx Bits
Set of cross recess Bits

12. Service points

If required, please contact the responsible person in your sales organisation. You will then immediately receive all necessary information on the comprehensive service.

13. Forms

This is an example for ordering spare parts for your hospital bed:

The identification plate and the model name of your bed are located at the inner side of the head part. Please note down the data on the order form.
By using the “Bed Data” menu item, the following information is shown in the display:

ID number
Hardware version
Software version

Please note down the data on the purchase order form.

Please locate the desired spare parts in the respective illustration.

Please enter the order numbers according to the indications given in the tables:

Quantity
Item number
Part designations

Völker AG
Wullener Feld 79
58454 Witten
GERMANY

Fax: +49-(0)2302-96096-66

Place and date

Company/stamp of the hospital

Signature

ID number:	
See identification plate	
See display (bed data)	
Model	
Hardware version: See display (bed data)	
Software version: See display (bed data)	

Contact person:

Phone number:

Purchase order:

	Number of pieces	Order number	Name
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Technical inspection S960-1 : chargers and potential equalization port			
Identification Number			
Check		OK	Comment
Visual inspection			
	Undercarriage/ telescopic support		
	Lying surface		
	Emergency lowering/CPR function		
	Lifting receiver		
	Bed power connection cable		
	Power supply unit		
	Power connecting plug		
	Cable placing inside the bed		
	Fit of screw connections		
	Housing of drive unit/battery box		
	Manual control unit cable		
	Manual control unit housing		
Functional test:			
Lateral grids	Locking		
	Deformation		
	Wear and tear		
Head and foot sections	Wear and tear		
Brake			
Rollers	Lying surface motors		
Drives	Undercarriage motors		
	Lift synchronism		
	Limit switch		

Check of accessories (lift-up device, assist rail with telescope, centre assist rail...):

Result of functional test:

OK ☐

Not OK ☐

Signature: _____

Date: _____

Technical inspection S960-1 : Chargers and potential equalization port		
Identification number		
Check		Reading
Electrics measurement	Device leakage current according to VDE 0751, limit value 0.25 mA	
	Potential compensation connection VDE 0751-1, limit value 0.2 Ohm	

Test result
OK ☐
Not OK ☐

Signature: _____

Date: _____

VÖLKER Klinikbetten

Konformitätserklärung / Declaration of Conformity / Déclaration de conformité

Konformitätserklärung

Anhang VII
EU-Richtlinie 93/42/EWG

Der Unterzeichnende
Völker AG
Wullener Feld 79
58454 Witten

bestätigt, dass die nachfolgend bezeichneten Produkte in der von uns in Verkehr gebrachten Ausführung die grundlegenden Anforderungen des Anhangs I der EU-Richtlinie 93/42/EWG erfüllen.
Es wurden die folgenden Normen angewendet :
DIN EN 60601-1,
DIN EN 60601-1-2,
DIN EN 60601-1-4,
DIN EN 60601-2-38.

Damit sind die Anforderungen des Medizinproduktegesetzes zur Anbringung einer **CE Kennzeichnung** erfüllt.

Bei einer nicht mit dem Hersteller abgestimmten Änderung des Produktes verliert diese Konformitätserklärung ihre Gültigkeit.

Bezeichnung der Produkte :
Klinikbetten S 960-1 und S 960-2.

EG-Richtlinien :
Richtlinie 93/42/EWG vom 14.06.1993 über Medizinprodukte (Anhang I „Grundlegende Anforderungen“).
Die Produkte sind Produkte der Klasse I gemäß Anhang VII des Medizinproduktegesetzes MPG vom 02.08.1994

Witten 23.06.03

Declaration of conformity

Appendix VII
EU Directive 93/42/EEC

The signatory
Völker AG
Wullener Feld 79
58454 Witten/Germany

confirms that the products described below and in the form distributed by ourselves meet the basic requirements of Appendix Iof EU Directive 93/42/EEC.
The followind standards are applied :
DIN EN 60601-1,
DIN EN 60601-1-2,
DIN EN 60601-1-4,
DIN EN 60601-2-38.

The requirements of the medical products law pertaining to the display of a **CE seal** of approval are thereby fulfilled.

This declaration of conformity becomes invalid if the products are altered without the agreement of the manufacturer.

Description of products
Type/Article No.:
Hospital beds S 960-1 and S 960-2.

EU Directives :
Directive 93/42/EEC of 14.06.1993 concering medical products (Appendix I, Basic requirements).
The design and construction of this product conforms to Class I (Appendix VII) Medical products law (MPG) of 02.08.1994.

Déclaration de conformité

Annexe VII
Directive EU 93/42/CEE

La soussignée
Völker AG
Wullener Feld 79
58454 Witten/Allemagne

confirme que les produits spécifies ci-dessous sont conformes, dans le modèle mis en circulation, aux exigences fondamentales de L’annexe L de la directive européenne 93/42/CEE.
Les standards suivants sont appliqués :
DIN EN 60601-1,
DIN EN 60601-1-2,
DIN EN 60601-1-4,
DIN EN 60601-2-38.

Les exigences de la loi sur les produits médicaux concernant leport de la **marque CE** sont ainsi satisfaites.

Cette déclaration de conformité est invaledée en cas de modification des produits, non autorisée par le fabricant.

Désignation des produits
Modèle/Référence :
Lits hospitaliers S 960-1 et S 960-2.

Directives européennes :
Directive 93/42/CEE du 14.06.1993 sur les produits médicaux (annexe I « Exigences fondamentales »). La conception du produit est conforme à la classe I (annexe VII). Loi sur les produits médicaux (MPG) du 02.08.1994.

ppa. Heinrich Völker
Vorstandsvorsitzender / Executive board (chair) / Directoire (Président)

Guidance and manufacturer´s declaration – electromagnetic emission for all equiqment AND systems (see 6.8.3.201 a) 3))		
The S960-1 is intended for use in the electromagnetic environment specified below. The customer or the user of the S960-1 should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment - guidance**
Harmonic emissions IEC 61000-3-2	Class A	The S960-1 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	
RF emissions CISPR 14 – 1	Complies	The S960-1 is not suitable for interconnection with other equipment.

Guidance and manufacturer´s declaration – electromagnetic immunity for all equiqment and systems (see 6.8.3.201 a) 6))			
The S960-1 is intended for use in the electromagnetic environment specified below. The customer or the user of the S960-1 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrostatic transient / burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines Not applicable!	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode Not applicable!	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5 % U_T (→95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles < 5 % U_T (→95 % dip in U_T) for 5 sec	< 5 % U_T (→95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles < 5 % U_T (→95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the S960-1 requires continued operation during power mains interruptions, it is recommended that the S960-1 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a. c. mains voltage prior to application of the test level.			

Guidance and manufacturer´s declaration – electromagnetic immunity for EQUIPMENT and SYSTEM that are not LIFE-SUPPORTING (see 6.8.3.201 b))

The S960-1 is intended for use in the electromagnetic environment specified below. The customer or the user of the S960-1 should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	Portable and mobile RF communications equipment should be used no closer to any part of the S960-1, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1{,}17\sqrt{P}$ $d = 1{,}17\sqrt{P}$ 80 MHz to 800 MHz $d = 2{,}33\sqrt{P}$ 800 MHz to 2,5 GHz where p is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m).[b] Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
Conducted RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the S960-1 is used exceeds the applicable RF compliance level above, the S960-1 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the S960-1.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and the equiqment or systems - for equiqment and systems that are not life-supporting (see 6.8.3.201 b))

The S960-1 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the S960-1 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the S960-1 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1{,}17\sqrt{P}$	80 MHz to 800 MHz $d = 1{,}17\sqrt{P}$	800 MHz to 2,5 GHz $d = 2{,}33\sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,37	0,37	0,74
1	1,17	1,17	2,33
10	3,69	3,69	7,38
100	11,67	11,67	23,33

For transmitters rated at a maximum output power not listed above the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.