Hillrom™

Centuris™ Bed System

Instructions for Use
Product No. P750

179643 REV 8

REVISION

PATENTS / PATENT hillrom.com/patents

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Hillrom reserves the right to make changes without notice in design, specifications, and models. The only warranty Hillrom makes is the express written warranty extended on the sale or rental of its products.

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

This manual (179643) was originally released and supplied in English. For a list of available translations, contact Hillrom Technical Support.

Product images and labels are for illustrative purposes only. Actual product and label may vary.

Eighth Edition, 2021-09

First Printing, 2013

Replace this manual (179643) if it is damaged and/or can not be read.

For product support or to order additional copies of this manual (179643), contact your distributor, local Hillrom representative, or go to hillrom.com.

Reference Documents

Centuris™ Bed Service Manual (179644)

Centuris™ Bed Unpacking Instructions (182515)

Table of Contents

NOTES:

INTENDED USE

The Centuris™ Bed System is intended for use in healthcare environments such as acute care and critical care.

Bed safe working load—204 kg maximum, this includes patient weight, mattress, IV pumps, poles, bags, and other equipment.

Intended Patient Population

WARNING:

Warning—Using the product outside of the recommended patient physical characteristics may cause patient injury, death, or equipment damage.

The intended patient population of this product are adult patients that meet all of these physical characteristics:

- Patient height—146 cm to 188 cm
- Patient weight—up to 169 kg

Intended Users

The intended users of this product are healthcare employees who have been trained to use the product, and who have the physical strength and cognitive skills to operate and control the product. There are some controls and features on the bed intended for use by the patients and family members after they receive use instructions from the caregiver. Follow facility safety protocols if an intended user does not have the physical strength or cognitive skills to operate and control the product safely.

INTRODUCTION

This manual provides instructions for normal operation of the Centuris™ Bed System. Before operating the bed, be sure that you have read and understood in detail the contents of this manual. It is important that you read and obey the aspects of safety that are in this manual. Any reference to a side of the bed is from the patient's view lying in the bed on his or her back.

SYMBOLS

DOCUMENT SYMBOLS

This manual uses different typefaces and symbols to make the content easier to read and understand:

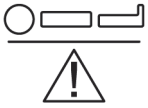
- Standard text—used for regular data.
- **Boldface text**—emphasizes a word or phrase.
- **NOTE:**—sets apart special data or important instruction clarification.
- WARNING, RELATIVE CONTRAINDICATION, or CAUTION

  - A WARNING identifies situations or actions that may have an effect on patient or user safety. To ignore a warning could cause patient or user injury.
  - A RELATIVE CONTRAINDICATION identifies situations or actions that may have an effect on patient safety.
  - A CAUTION identifies special procedures or precautions that persons must obey to help prevent equipment damage.

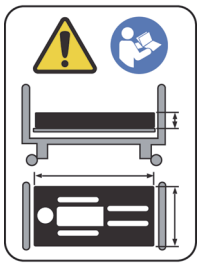
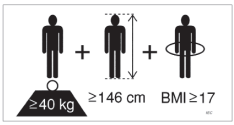
PRODUCT SYMBOLS

These symbols may or may not be on your version of the Centuris™ Bed System

Symbol	Description
	Type B equipment in accordance with EN 60601-1.
IPX4	In accordance with IEC 60529, rating for protection against fluid ingress and identified as equipment that is protected against unpressurized spraying and splashing water.
IPX5	In accordance with IEC 60529, rating for protection of water projected by a nozzle (6.3 mm) against enclosure from any direction shall have no harmful effects. (For Battery Box)
IPX6	In accordance with IEC 60529, rating for protection of water projected by powerful jets (12.5 mm nozzle) against enclosure from any direction shall have no harmful effects. (For Hand-held Pendant)
	Conforms to the European Union Medical Device Regulation (EU) 2017/745. The CE mark was first applied in 2013.

Symbol	Description
	Do Not Use with Oxygen Tents—use oxygen administering equipment of the nasal, mask, or ventilator type only.
	Alternating current
	Safe working load—for the bed and accessories
	Total bed weight including the safe working load
	Maximum patient weight
	Duty cycle
	Dangerous voltage
	Fuse
	Protective earth (ground)

Symbol	Description
	Environmental Protection: Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or a retailer for recycling advice.
	(Applicable on the backup battery) Batteries should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or a retailer for recycling advice.
	Authorized Representative in the European Community
	Catalog number
	Serial number
	Medical Device
	Date of manufacture
	Manufacturer and date of manufacture
	Manufacturer and date of manufacture (available only on some units)
	Consult accompanying documents.

Symbol	Description
	Indicates handle for lowering the backrest in an emergency to do cardiopulmonary resuscitation (CPR).
	Indicates Neutral and Brake position of the brake/steer pedal (individual brake caster beds only).
	Indicates Neutral/Brake/Steer position of the brake steer pedal (foot end brake/steer beds only).
	Do not sit or stand on the foot extension.
	Mattress compatibility—must consult accompanying document.
	Pinch point—between the upper and lower frames.
	Pinch point—between the footboard/headboard and the sleep deck.
	Physical description of an adult

SAFETY INFORMATION

BED

WARNING:

Obey all **warnings** throughout the manual and also those below to help prevent injury and/or equipment damage:

- **Warning—**Make sure the bed is connected to AC power and works correctly before you put a new patient on the bed.
- **Warning—**Do not operate the bed in the presence of flammable gas or vapors.
- **Warning—**Use oxygen administering equipment of the nasal, mask, or ventilator type only. Do not use the bed with oxygen tents or in oxygen rich environments.
- **Warning—**It is recommended that the unit be in the low position (with the side rails latched) when the patient is unattended. This may reduce the severity of any resultant injuries from patient falls.
- **Warning—**When a patient's condition (such as disorientation due to medication or clinical condition) could lead to patient entrapment, the sleep deck should be left in the flat and lowest position while unattended (except when required otherwise by medical staff for special or particular circumstances).
- **Warning—**Before putting the bed in the Trendelenburg or Reverse Trendelenburg position, make sure the end of the bed is at least 15 cm from the wall when fully raised and that the area under the bed is free from obstructions.
- **Warning—**Make sure hands, arms, legs, and feet are not under the bed or between sleep deck sections as they move.
- **Warning—**When you change bed positions, make sure that hands, feet, and equipment are away from the frame assemblies.
- **Warning—**Make sure you position tubes, lines, and linens away from moving parts. Failure to do so could cause patient injury.
- **Warning—**Mechanical parts under the bed pose a risk of serious injury. Exercise control over visitors, especially children, to keep people out from under the bed and prevent unauthorized access to the bed positioning controls.
- **Warning—**Using the lockout system can significantly reduce potential for unintentional movement. If a patient's condition is such that injury could result from unintentional movement, use the lockout system.
- **Warning—**Make sure there is sufficient distance between the bed and the power outlet to unplug the bed.
- **Warning—**When you put cables from other equipment on the bed, use caution to avoid pinching the cables between moving parts of the bed.
- **Warning**—The Centuris™ Bed System is MR Unsafe. Do not expose the bed to any magnetic resonance (MR) environment.

  NOTES:

  - The bed may present a risk of projectile injury due to the presence of ferromagnetic materials that can be attracted by the MR magnet core.
  - The bed may not function properly due to the strong magnetic and radio frequency fields generated by the MR equipment.

SIDERAILS

WARNING:

To help prevent patient injury and/or damage to the equipment, obey these **warnings**:

- **Warning—**Evaluate patients for entrapment risk according to facility protocol, and monitor patients appropriately. Make sure that all siderails are fully latched when in the raised position.

NOTE:
Siderails are intended to be a reminder to the patient of the unit's edges, not a patient-restraining device. When appropriate, Hillrom recommends that medical persons determine the correct methods necessary to make sure that the patient remains safely in bed.

- **Warning—**Use of a mattress overlay or thicker mattress reduces the effective height of the siderails above the sleep surface. Evaluate the patient for the risk of falls, and take appropriate measures.

To make sure the siderails are latched, give the siderails a gentle push in a downward direction.

PATIENT RESTRAINTS

WARNING:

Warning—Patient restraints are not intended as substitutes for good nursing practices. Physical restraints, even correctly installed, can cause entanglement, physical injury, and death, particularly with agitated and disoriented patients. Monitor patients when using physical restraints in accordance with legal requirements and facility protocol.

1. Develop guidelines for all patients to determine:
   - Which patients may need to be restrained and the appropriate restraint to use.
   - The correct method to monitor a patient, whether restrained or not, include the time interval, visual check of restraint, and such.
2. Develop training programs for all caregivers in regard to the correct use and application of restraints.
3. Keep the bed at its lowest position whenever a caregiver is not in the room.
4. Clarify the need for restraint devices to families or guardians.
5. Use only the locations on the sleep deck (eight total) to attach the patient restraints to.

For restraining devices, consult the restraint manufacturer's instructions for use to verify the correct application of each restraining device.

BRAKES

WARNING:

Warning—Except for transporting a patient, always set the brakes when the bed is occupied. Make sure that the brakes are set before you move the patient from the bed. Failure to do so may result in injury or equipment damage.

Patients often use the bed for support when getting off the bed and could be injured if the bed unexpectedly moves. After setting the brakes, push and pull the bed siderails to make sure it is secure.

Electrical Safety

WARNING:

To help prevent injury and/or damage to the equipment, obey these **warnings**:

- **Warning—**Servicing the bed without disconnecting it from the power source or its backup battery could result in personal injury or equipment damage.
- **Warning—**Make sure the bed is connected to the correct mains power. Do not connect a 120 V bed to a 230 V power supply, and do not connect a 230 V bed to a 120 V power supply.
- **Warning—**To reduce the risk of electric shock, the bed should only be connected to supply mains with a power cord with protective earth, supplied by Hillrom.
- **Warning—**Incorrect use or handling of the power cord may cause damage to the power cord. If damage has occurred to the power cord, immediately remove the bed from service, and contact the applicable maintenance persons.

When the integrity of the external protective earth conductor is in doubt, operate the bed from its internal battery backup.

The bed frame and casters are not grounded. Do not use them for device grounding.

NOTE:
The power cord is non-detachable and should only be replaced by trained service persons.

Emergency CPR

The emergency CPR is to be used by healthcare professionals **only**.

Battery Backup

CAUTION:

Caution—If the bed will not be in service for an extended period of time, have appropriate maintenance personnel recharge the battery at least **every six months**. Failure to do so could result in damage to the life of the battery or to the bed. A full charge of the battery will take up to twenty-four hours. If the bed is not fully charged, the user can still make use of battery power for brief usage of articulation controls.

The battery backup power comes from a lead acid battery, which needs to be disposed of correctly and according to your local regulations. For assistance in disposing of the battery, contact your maintenance technician.

Mattresses

WARNING:

To help prevent injury and/or damage to the mattress, obey these **warnings**:

- **Warning—**Mattresses that are undersized for the frame create a gap between the mattress and the siderails. The risk increases for patient entrapment or suffocation. Evaluate patients for vulnerability, and monitor patients appropriately.
- **Warning—**If the patient remains in the bed when the bedding is changed, do **not** pull on the bedding with excessive force.
- **Warning—**Patients should not be permitted to smoke in bed. Sheets and pillows generally do not have flame-resistant properties.

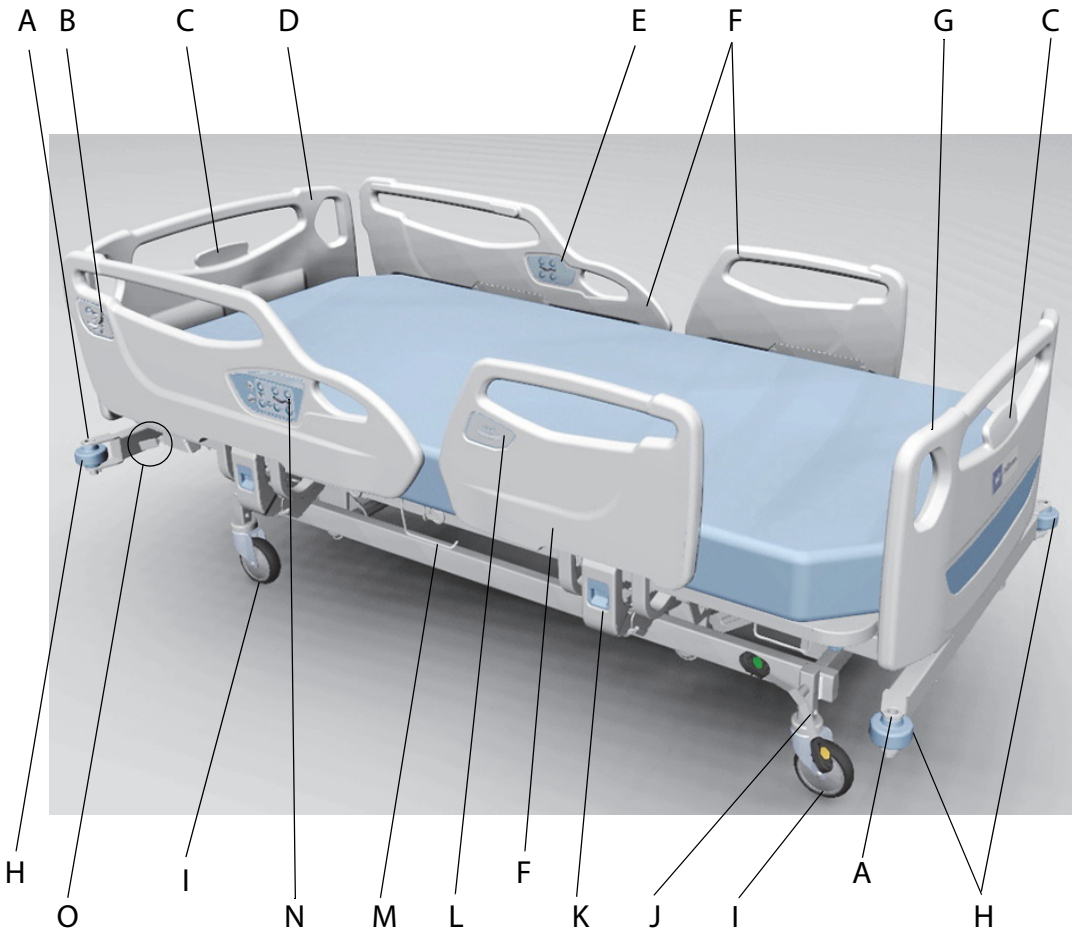
TRANSPORT

WARNING:

To help prevent injury and/or damage to the equipment during transportation, obey these **warnings**:

- **Warning—**The bed is intended to be used to transport patients with the foot end or head end of the bed forward. Before transport, correctly store the power cord to help prevent tripping. Use only the end panels to move the bed during transport.
- **Warning—**Make sure the bed is not transported over a side inclination of more than 5°. Make sure that all siderails are fully latched and put the bed to its lowest possible position during transportation.
- **Warning**—Moving the bed by pushing or pulling other parts of bed or accessories may cause injury or equipment damage.

FEATURES



Item	Description
A	Equipment sockets
B	Head angle indicator
C	Power cord storage
D	End panel—Headboard
E	Patient controls
F	Siderails
G	End panel—Footboard
H	Corner bumpers
I	Casters, 12.5 cm
J	Four-corner brake pedal or foot-end brake and steer bar
K	Siderail release lever
L	Bed angle indicator
M	Drainage holder
N	Caregiver controls
O	Emergency CPR handle

These features may or may not be on the Centuris™ Bed System:

- Battery backup function
- Four DC motors
- Complete bed articulation: bed, head, and knee up/down, Trendelenburg/Reverse Trendelenburg, and Auto Contour™ Feature
- Lockout controls

CAREGIVER CONTROLS

This section describes the bed controls that are intended to be used by the caregiver. Not all controls listed are available on all versions of the bed.

Warning—Instruct patients and visitors not to use caregiver controls at any time. Visitors may assist patients in the use of patient controls. Unauthorized use of the caregiver controls may cause injury, cross-contamination, or equipment damage.

NOTE:
Bed controls can be used for a maximum of 2 minutes continuously and need to be at rest for at least 18 minutes after each continuous operation.

USE THE EMERGENCY CPR HANDLE

The emergency CPR handles are located at each sides of the head-end, under the sleep deck.

NOTE:
When activated, the emergency CPR handles disengage the head section actuator so that the head section may lower to the horizontal position. This function can be used when power is not available.

1. Raise the siderail if it is at the down position.
2. Check and remove any obstacles under the head section of the bed.
3. Lift and hold the emergency CPR handle. Hold the handle until the head section comes to a stop in the flat position.
4. Release the handle.

NOTE:
The Emergency CPR handle **must** be held until the head section of the bed reaches a flat position. Releasing the control handle will cause the head section to stop lowering.

The head section actuator is automatically re-enabled after the CPR control handle is released and the **Head Down** control is pressed.

Raise and Lower the Siderails

WARNING:

Warning—Evaluate patients for entrapment risk in accordance with facility protocol, and monitor patients appropriately. Make sure all siderails are fully latched when in the raised position. Failure to do either of these could cause serious injury or death.

NOTE:

Siderails are intended to be a reminder to the patient of the unit's edges, not a patient-restraining device. When appropriate, Hilrom recommends that medical persons determine the correct methods necessary to make sure a patient remains safely in bed.

When the bed is occupied, follow facility protocol for siderail usage.

Raise a Siderail

1. Pull the siderail up to its highest position until you hear a **click**.
2. After you hear the click, gently pull on the siderail to make sure it is locked in position.

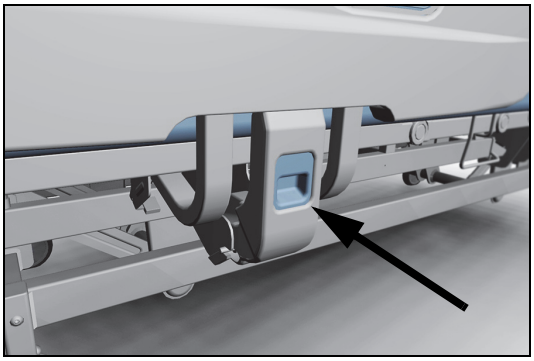
Lower a Siderail

1. Pull up on the siderail release lever.

CAUTION:

Caution—Do not use force to lower the siderail. Equipment damage could occur.

2. The siderail automatically lowers to the down position **without** caregiver assistance.



CAREGIVER SIDERAIL CONTROLS

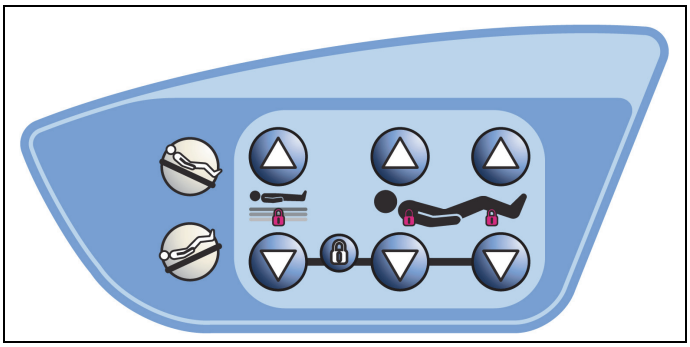
NOTE:
Caregiver siderail controls are not available on configurations shipped with the caregiver pendant controls.

WARNING:
Warning—Before you lower the bed, look under the bed to make sure there are no people or obstructions between the lower and upper frames of the bed. Failure to do so could cause serious injury or equipment damage.

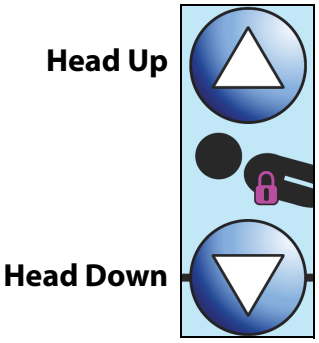
NOTE:
Bed controls can be used for a maximum of 2 minutes continuously and need to be at rest for at least 18 minutes after each continuous operation.

These controls are on the outside of the head-end siderail:

- Bed Up/Down
- Head Up/Down
- Knee Up/Down
- Trendelenburg
- Reverse Trendelenburg
- Articulation lockouts



Raise and Lower the Head Section



Press and hold the **Head Up** control to raise the head section to the applicable position. The head section can rise to an angle of 65°.

Press and hold the **Head Down** control to lower the head section to the applicable position.

To determine the specific degree of the head section, look at the head angle indicators located on each side of the bed.

Auto Contour™ Feature

The bed is equipped with an Auto Contour™ mode. When the **Head Up** control is pressed, the Auto Contour™ mode raises the knee section to a maximum of 25°. When the head section is lowered, the knee section will go to the flat position.

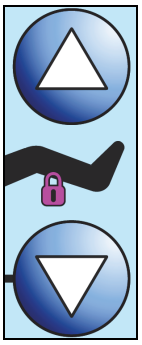
- Auto Contour™ Feature—Press and hold the Head control. The head and knee sections rise together and may reduce patient migration toward the foot end of the system.

Raise and Lower the Knee Section

Press and hold the **Knee Up** control to raise the knee section. The knee section can rise to 25°. When the knee section goes up or down, the foot section will also go up or down.

Press and hold the **Knee Down** control to lower the knee section.

Knee Up



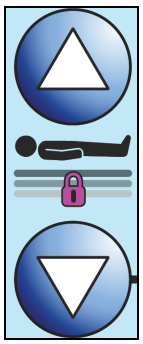
Knee Down

Raise and Lower the Bed

The bed adjusts in height from a low position, for patient entry or exit, to a high position, for examination.

Press and hold the **Bed Up** control to raise the bed to the applicable position.

Bed Up



WARNING:

Warning—Use caution when you lower the bed frame. To avoid injury, keep extremities from under the lowering bed frame.

Bed Down

Press and hold the **Bed Down** control to lower the bed to the applicable position.

Put the Bed into Trendelenburg or Reverse Trendelenburg

WARNING:

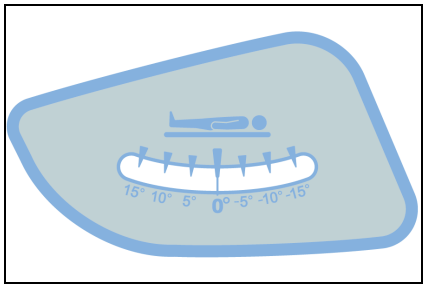
Warning—Before putting the bed in the Trendelenburg or Reverse Trendelenburg position, make sure the end of the bed is at least 15 cm from the wall when fully raised and that the area under the bed is free from obstructions. Failure to do so could cause patient injury, personal injury, or equipment damage.

1. Make sure the end of the bed is at least 15 cm from the wall.
2. Make sure the area under the bed is free from obstructions.
3. Press and hold the **Trendelenburg** or **Reverse Trendelenburg** control to adjust the bed to the applicable position.

Reverse Trendelenburg

Trendelenburg

NOTE:
To determine the specific degree of Trendelenburg or Reverse Trendelenburg, refer to the Trendelenburg indicators that are on each side of the bed.



Position Indicator

Lockout Controls

WARNING:

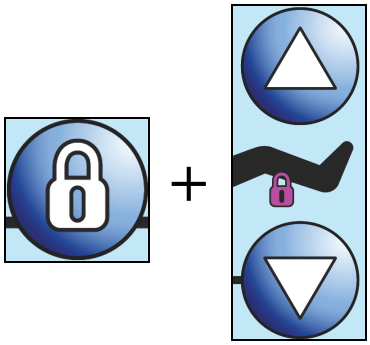
Warning—Locking the controls can significantly reduce the potential for unintentional movement. If a patient's condition is such that injury could occur from unintentional movement, lock out the patient controls. Failure to do so could result in patient injury or equipment damage.

To lock—

Press the **Lockout** control and the applicable articulation control at the same time. When the lock indicator light comes on, the function is locked out.

To unlock—

Press the **Lockout** control and the applicable articulation control at the same time again. When the lock indicator light goes off, the function is no longer locked out.



The knee lockout is shown as an example.

Pendant Controls

The pendant controls are intended to be used by the **caregiver**.

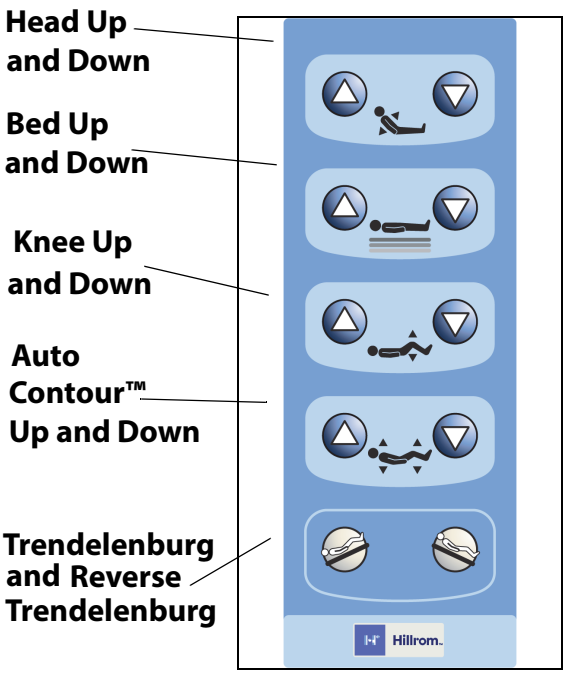
NOTE:
Caregiver pendant controls are not available on configurations shipped with the caregiver and patient siderail controls.

WARNING:

To prevent patient injury and/or equipment damage, obey these **warnings**:

- **Warning**—The caregiver pendant is for use by the caregiver. Store out of reach of the patient when not in use.
- **Warning**—The pendant is not for use inside of an oxygen tent.

The pendant controls operate the same way as the siderail controls. When the pendant lock out is activated, all articulation will be locked out.



NOTES:

- The Trendelenburg/Reverse Trendelenburg control on the pendant is optional.
- For details on Auto Contour™, see page 13.

To remove from the siderail—

- Pull the pendant straight up.

or

- Turn the pendant clockwise or counterclockwise until the mount clip disengages from the siderail or footboard.

To store—

WARNING:

Warning—The pendant should not be stored under the mattress. Patient injury or equipment damage could occur.

- Push straight down on the pendant until the mount clip engages on the siderail.
- Make sure the pendant is secured by the stopper on the siderail.

Lockout Pendant Controls

The pendant lockout is on the right side of the bed below the sleep deck. The control disables all functions on the pendant.

WARNING:

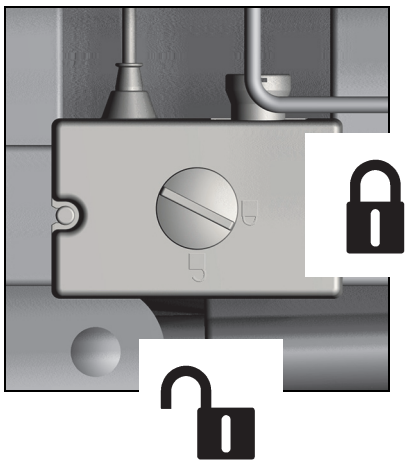
Warning—Locking the pendant controls can help to reduce the potential for unintentional patient movement. If a patient's condition is such that injury could occur from unintentional movement, lock out the pendant controls. Failure to do so could result in patient injury or equipment damage.

To lock—

- Turn the switch to the **Lock** position.

To unlock—

- Turn the switch to the **Unlock** position.

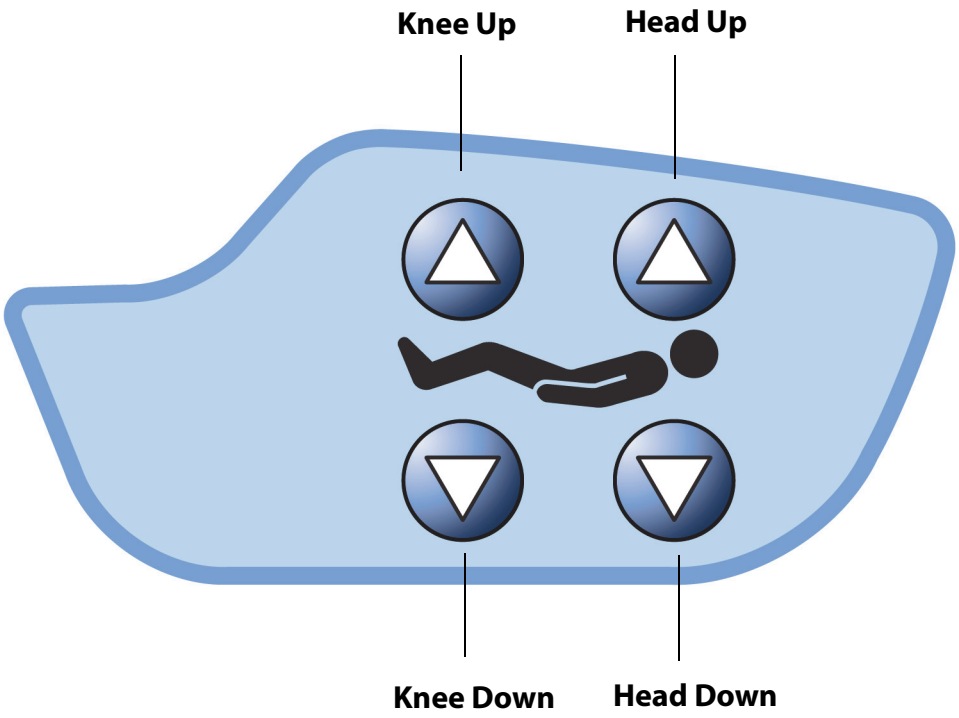


PATIENT CONTROLS

The patient controls are on the inside of the head-end siderails. They function in the same way as the caregiver controls. See "Caregiver Siderail Controls" on page 13.

NOTES:

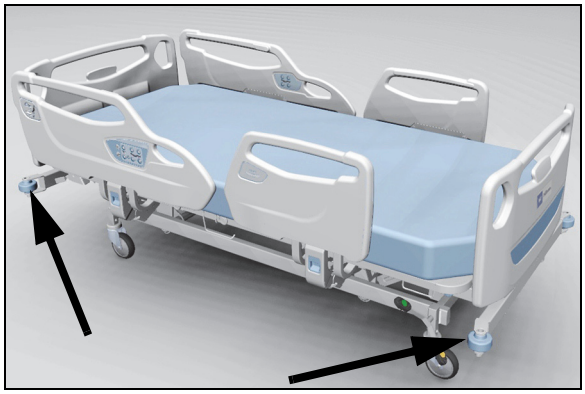
- Caregivers shall provide the necessary instructions and warnings to the patient or visitor on how to use the bed safely.
- Patient controls are not available on configurations shipped with the caregiver pendant controls.



FRAME FEATURES

EQUIPMENT SOCKETS

An IV pole can be installed in any of the four equipment sockets located at the four corners of the bed.



BED END PANELS (HEADBOARD AND FOOTBOARD)

The bed has mount holes for the bed end panels.

WARNING:

Warning—When you install the end panels, make sure there is nothing between the panel and the bed frame. Injury or equipment damage could occur.

To install—

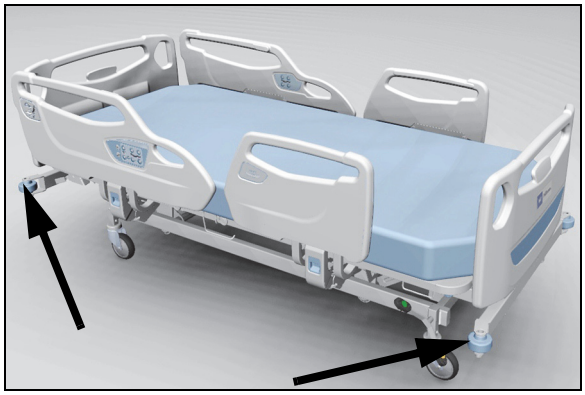
- Install a bed end panel by fitting it into the two vertical mount holes at the end of the bed. Make sure the bed end panel is fully secured before use.

To remove—

- Remove a bed end panel by lifting it vertically off the mounting holes.

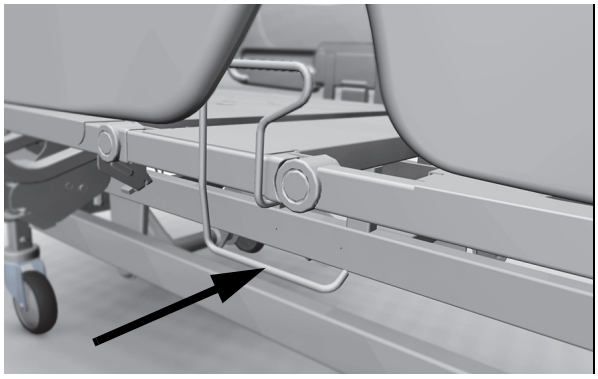
BUMPERS

Bumpers are at the four corners of the bed.



Drainage Bag Holders

Drainage bag holders are on both sides of the bed. Each drainage bag holder can support up to 4 kg.



Brake And Steer

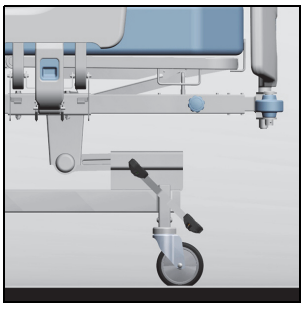
There are two configurations of brake and steer: **Foot-end** and **Individual**.

WARNING:

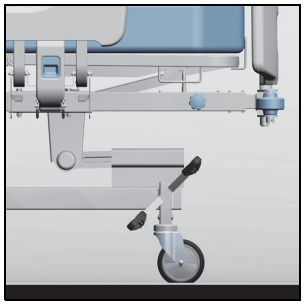
Warning—Except for transporting a patient, always set the brakes when the bed is occupied. Make sure that the brakes are set before you move the patient from the bed. Failure to do so may result in injury or equipment damage.

Foot-End Brake and Steer

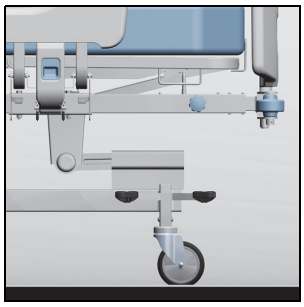
The foot-end brake and steer pedals are above the casters on the foot-end of the bed. There are three positions: Brake, Steer, and Neutral. Use the steer mode to help move the bed in a straight line. Use the brake to keep the bed from moving. Use neutral to move the bed to be sideways.



Brake—Step down on the orange Brake Pedal. Push and pull on the system to make sure that the brake is fully engaged.



Steer—Step down on the green Steer Pedal.



Neutral—Put the Brake/Steer Pedal in the level position.

Individual Brake and Steer

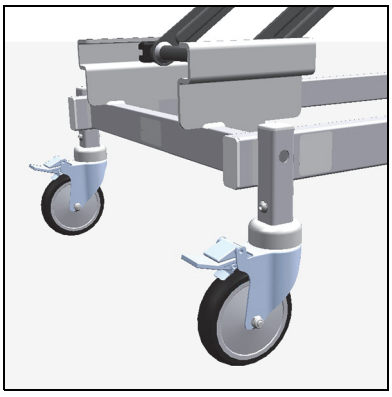
The brake casters are at the four corners of the bed.

To lock—

- Step on the lower end of the brake lever to lock the caster.

To unlock—

- Step on the upper end of the brake lever to push it forward and unlock the caster.

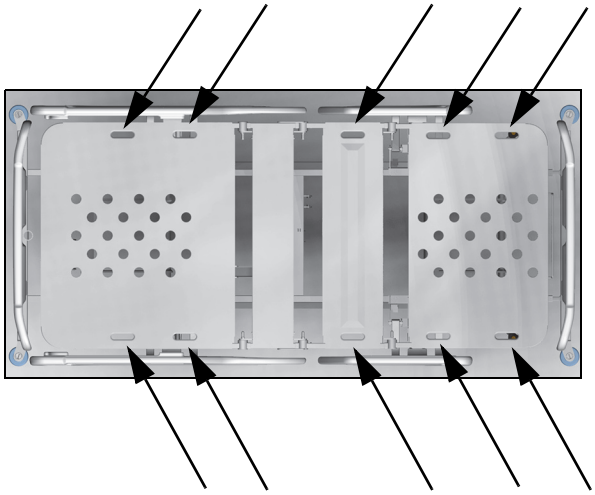


Patient Restraint Straps

WARNING:

Warning—Patient restraints are not intended as substitutes for good nursing practices. Physical restraints, even correctly installed, can cause entanglement, physical injury, and death, particularly with agitated and disoriented patients. Monitor patients when using physical restraints in accordance with legal requirements and facility protocol.

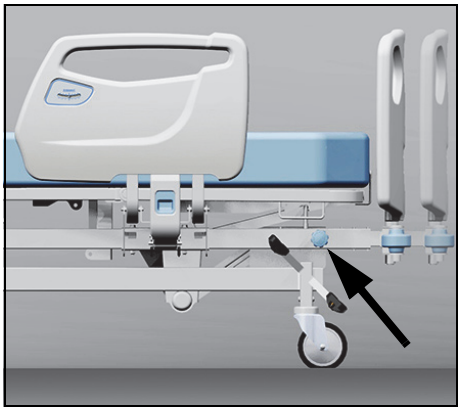
Installation slots for patient restraint straps are on both sides of the sleep surface, near the siderails. For restraining devices, consult the restraint manufacturer's instructions for use to verify the correct application of each restraining device.



Foot Extension

NOTE:
This feature is only available on certain bed configurations.

The foot extension allows the foot section to extend to 10 cm.



To extend the foot section—

1. Loosen the control knobs on each side of the bed under the foot section.
2. Pull the foot section out until it stops.
3. Tighten the control knobs.
4. When the foot section is extended, insert the mattress foot extender[1] pad between the mattress and the footboard.

To retract the foot section—

1. Remove the mattress foot extender pad.
2. Loosen the control knob on each side of the bed under the foot section.
3. Push the foot section in until it is fully retracted.
4. Tighten the control knobs.

Battery Backup

The bed has a battery backup on certain bed configurations. The battery permits you to operate the Bed, Head, and Knee Up/Down functions when AC power is not available.

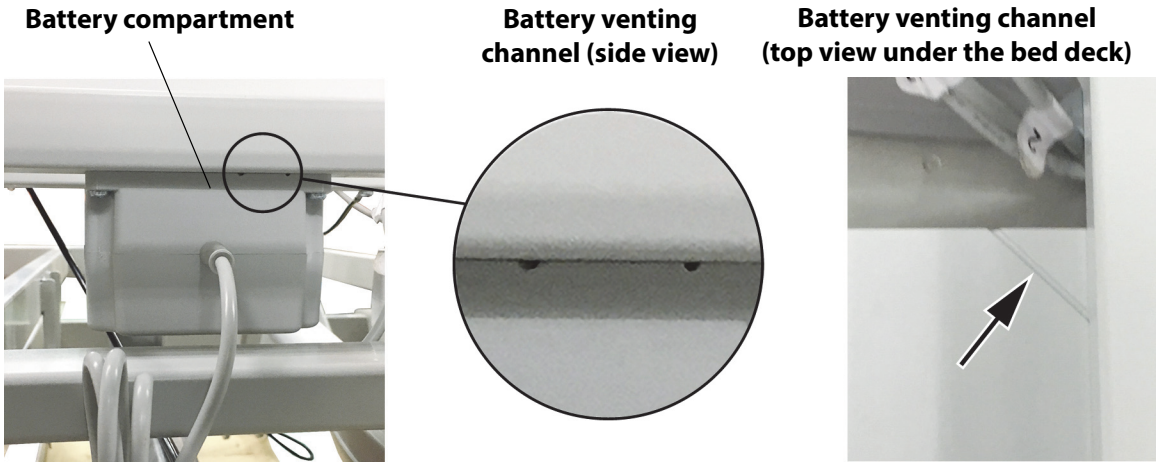
When the battery charge level is not sufficient enough to operate the bed, and a control is pressed, an alarm sounds. Connect the bed to AC power to recharge the battery.

1. The mattress foot extender pad is not sold with this product. Contact Hillrom Technical Support for compatible foot extender pads.

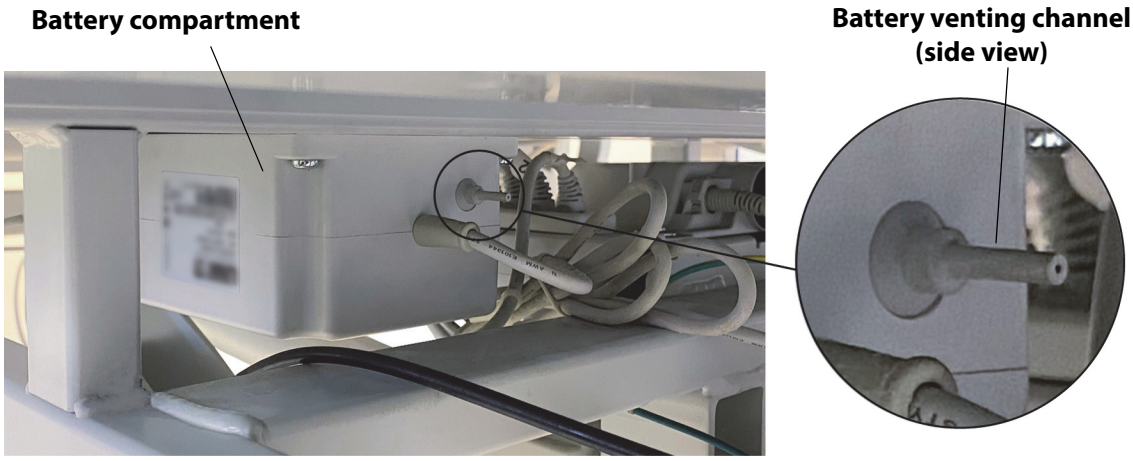
WARNING:

To help prevent injury and/or damage to the battery, obey these **warnings**:

- **Warning**—Exposure of the battery to fire or equipment that emit sparks may cause fire and/or explosion.
- **Warning**—Defective or damaged batteries may leak acid. Take adequate precautions during handling and transportation of the defective or damaged batteries.
- **Warning**— Exposure of the battery to an impact (for example, a collision, a powerful stroke or dropping it on the floor) may lead to an explosion when the battery is in use. Remove the bed from service immediately and contact Hillrom Technical Support.
- **Warning**—The battery has a venting channel that may emit flammable gases to prevent gas build-up. Blocking or covering the venting channel may create a positive pressure and lead to explosion when the battery is in use.



For beds manufactured before 2020:



CAUTION:

Caution—If the bed will not be in service for an extended period of time, have the applicable maintenance persons charge the battery at least every 6 months. Failure to do so could result in the damage to the life of the battery.

Make sure the battery is always charged, plug the bed into an applicable power outlet whenever possible.

NOTES:

- If the battery alarm sounds, it may take **8 to 12 hours** to fully recharge.
- Before the bed is used for the first time, charge the battery for at least 24 hours or longer.

Battery Disposal

The battery backup power comes from a lead acid battery.Hillrom recommends replacing the battery **every three years**. Recycle the battery in accordance to your local regulations.

MATTRESS

WARNING:

To help prevent injury, death and/or damage to the mattress, obey these **warnings**:

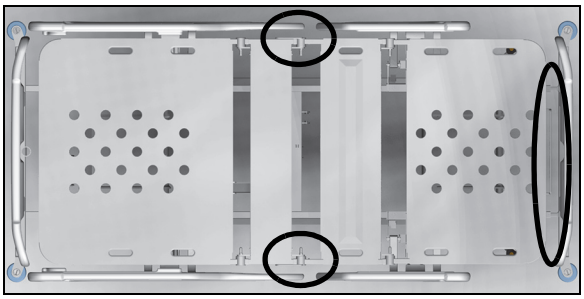
- **Warning—**Mattresses that are undersized for the frame create a gap between the mattress and the siderails. The risk increases for patient entrapment or suffocation. Evaluate patients for vulnerability, and monitor patients appropriately.
- **Warning**—The use of a mattress overlay or a thicker mattress reduces the effective height of the siderails above the sleep surface, resulting in a higher risk of falling. Evaluate the patient for the risk of falls, and take appropriate safety measures.
- **Warning—**If the patient stays in the bed when the bedding is changed, do **not** pull on the bedding with excessive force.
- **Warning—**Patients should not be allowed to smoke in bed. Sheets and pillows generally do not have flame-resistant properties.

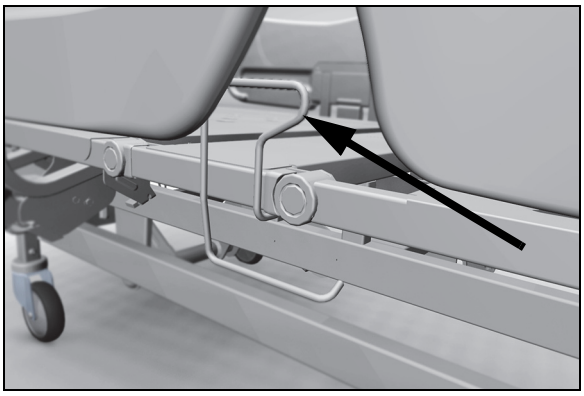
Compatible Mattresses from Hillrom

Model	Size (length x width x thickness)
NP50 (ASS028)	198 cm x 90 cm x 14 cm
NP50 (P50A7F)	203.2 cm x 90.2 cm x 15.2 cm
NP100 (ASS031)	198 cm x 90 cm x 14 cm
NP100 (P100A4)	203.2 cm x 90.2 cm x 15.2 cm
NP150 (ASS034)	198 cm x 90 cm x 14 cm

Mattress Retainers

There are three mattress retainers on the bed. One on each side of the sleep deck and one at the foot end of the sleep deck. The retainers help the mattress to stay in the correct position on the bed.





Power Cord Management

WARNING:

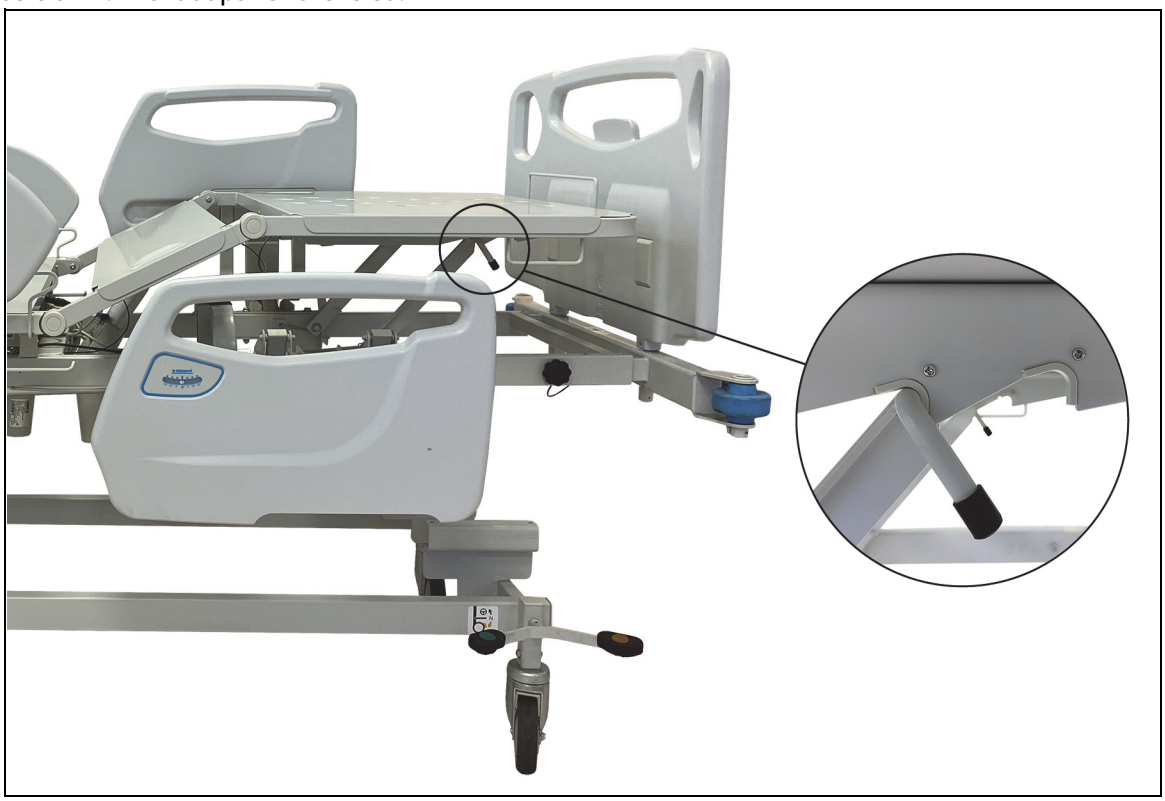
Warning—Improper power cord management could lead to tripping or damage to the power cord, leading to electrocution.

If the bed needs to be moved, disconnect the power cord from the power outlet. Coil the power cord around the power cord holder as shown.

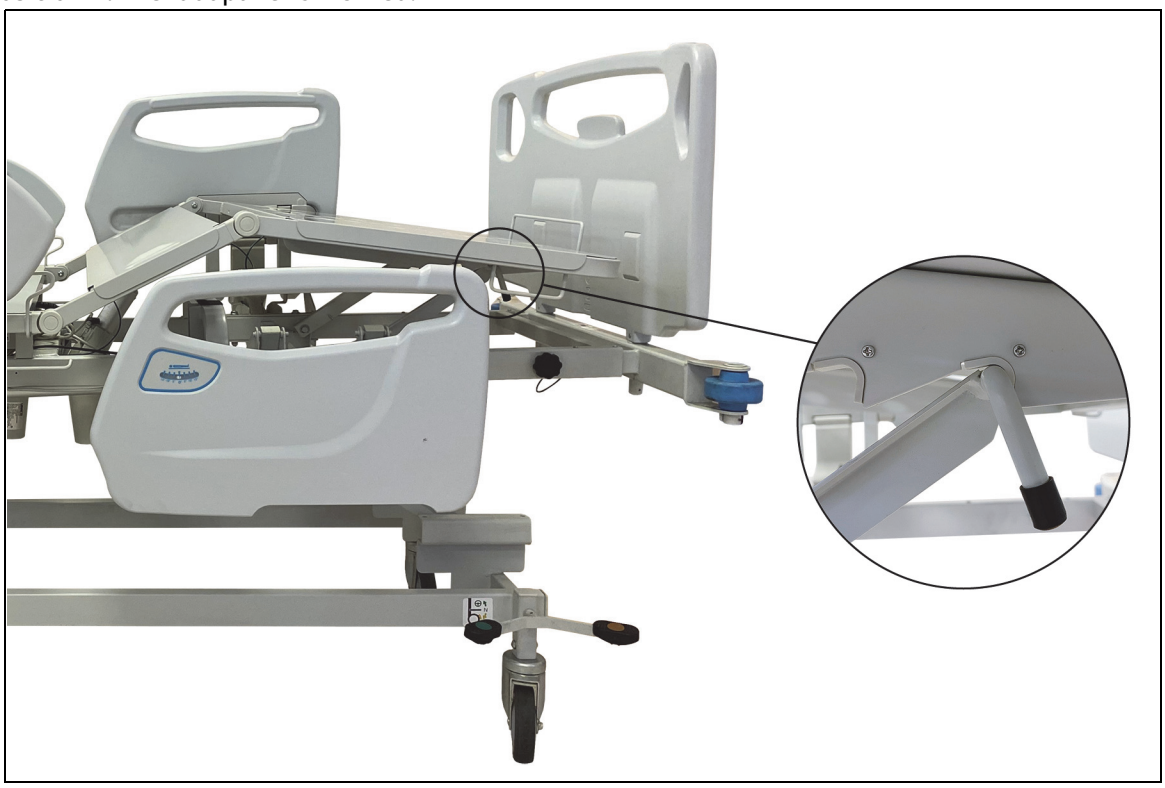
Adjustable Foot Panel

The foot panel can be placed in two different positions and is held in place by the mechanical notches.

Position 1: The foot panel is leveled.



Position 2: The foot panel is inclined.



ACCESSORIES

WARNING:

Warning—Use of accessories that are not listed below might lead to patient injury or equipment damage. Caregivers shall perform the risk assessment and mitigation based on the facility protocol.

Accessories

Part Number	Description
P1445A	Removable IV pole
P145920	Removable IV pole (offset style)
P145910	Oxygen tank holder
P145911	Patient helper with handle
P145912 (4655004578)	Traction frame

REMOVABLE IV POLE

The IV pole is a removable, telescopic pole that installs in any of the equipment sockets.

WARNING:

Obey all **warnings** below to help prevent injury and/or equipment damage:

- **Warning—**Do not exceed the load capacity of the IV pole. If the IV pole is overloaded, injury or equipment damage could occur.
- **Warning—**Failure to correctly install the IV pole could allow it to fall, resulting in injury or equipment damage.
- **Warning—**Uneven loading of the IV pole could allow the contents to fall, and could cause injury or equipment damage.

Removable IV Pole (P1445A)

The IV pole (P1445A) hook can hold a weight of 11 kg.

To install—

1. Insert the IV pole vertically into any of the equipment sockets at either the head end or foot end of the bed.
2. Turn clockwise to secure the IV pole in the socket.
   - **To raise the IV pole**—pull the knob out, grasp and raise the upper section of the pole until it clicks and locks into place. Make sure that the IV pole stops at one of the four height adjustment slots available.
   - **To retract the height of IV pole**—pull the knob out and lower the upper section of the pole section. Make sure that the IV pole stops at one of the four height adjustment slots available or is fully lowered.

To remove—

Turn the IV pole counter-clockwise and then pull the pole upwards.

Removable IV Pole (P145920—Offset Style)

Each hook on the IV pole (P145920—Offset Style) can hold a weight of 2 kg.

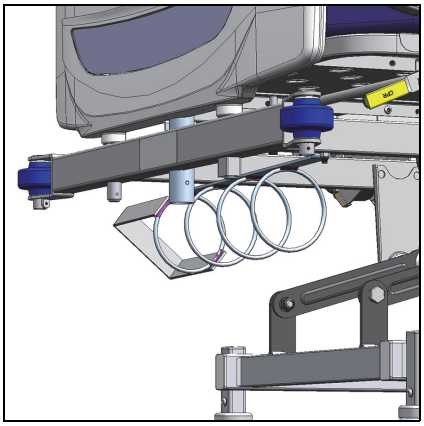
To install—

1. Insert the IV pole vertically into any of the equipment sockets at either the head end or foot end of the bed.
2. Turn the IV pole counter-clockwise to secure it in the socket. Make sure that the pole is facing towards the bed and not outwards. See the graphic for the recommended position.
    - To adjust height of IV pole, loosen the knob by turning it counter-clockwise. Raise or lower the upper section of the pole. Once the desired height is achieved, hold the upper section of the pole at the desired position and tighten the knob by turning clockwise.

To remove—

- Turn the IV pole clockwise and then pull the pole upwards.

Oxygen Tank Holder (P145910)



The oxygen tank holder is mounted at the head-end of the bed. The tank holder is compatible with oxygen cylinders of type D and E. The safe working load of the oxygen tank holder is 13.6 kg.

NOTE:
Make sure the oxygen tank holder is installed by a trained service person.

WARNING:
Obey all **warnings** below to help prevent injury and/or equipment damage:

- **Warning—**Failure to follow facility protocols when you use oxygen equipment and supplies could cause injury or equipment damage.
- **Warning—**When you install or remove the oxygen tank from the oxygen tank holders, do not lift or pull the oxygen tank by the regulator.
- **Warning—**Do not use an oxygen tank that has a regulator that extends past the bumpers on the bed.
- **Warning—**Do not use a humidifier with an oxygen tank in the horizontal position.
- **Warning—**Do not exceed the load capacity of the tank holder.

To install an oxygen tank (of type D or E)—

1. With the oxygen tank parallel to the ground and its regulator towards the right, slide the tank into the tank holder. Make sure the base of the tank touches the metal plate at the end of the tank holder.
2. Make sure the tubing is away from any moving parts.

Patient Helper (P145911)

The Patient Helper installs in the center equipment socket at the head end of the bed.

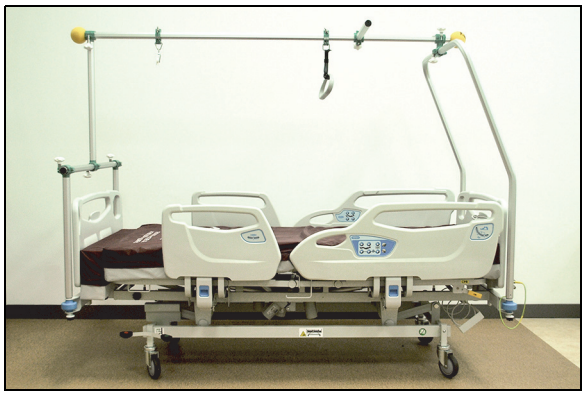
WARNING:

Warning—Do not exceed the load capacity of the Patient Helper. If the Patient Helper is overloaded, injury or equipment damage may occur.

The safe working load of the Patient Helper is 75 kg.

NOTE:
Make sure the patient helper is installed by a trained service person.

Traction Frame (P145912)



The Traction Frame is mounted in the equipment sockets at each corner of the bed.

Refer to the manufacturer's installation and user instructions for operation information and safe working load.

WARNING:

Obey all **warnings** below to help prevent injury and/or equipment damage:

- **Warning—**When a traction frame is used for mounting Buck's traction, the knee controls should be locked out.
- **Warning—**When a traction frame is used for cervical traction, the head and knee controls should be locked out.
- **Warning—**To avoid injury, the bed should not be operated until all persons are clear of mechanisms and the traction frame.
- **Warning—**Do not use the traction frame to push, pull, or steer the bed. Use the end panels.
- **Warning—**After the traction frame is installed, check the thigh section for proper, unobstructed movement, and check the siderails to make sure latching in the up position, and proper operation.

CLEANING AND DISINFECTING

WARNING:

To help prevent injury and/or equipment damage, obey these **warnings**:

- **Warning—**The potential for electrical shock exists with electrical equipment. Failure to follow facility protocol could cause death or serious injury.
- **Warning—**Do not reuse wiping material for multiple steps or on multiple products.
- **Warning—**Harmful cleaning solutions may cause skin rash and/or irritation upon contact. Follow the manufacturer's instructions found on the product label and Safety Data Sheet (SDS).
- **Warning—**Lift and move items correctly. Do not twist, and seek assistance when necessary. Make sure the bed is at a correct height to lift items off the bed.
- **Warning—**Fluid spills on to the bed electronics could cause a hazard. If such a spill occurs, unplug the bed, and remove it from service. When fluid spills occur outside of what is seen in normal use, immediately do as follows:
  a. Unplug the bed from its power source.
  b. Remove the patient from the bed.
  c. Clean the fluid spill from the bed system.
  d. Have maintenance examine the system completely.
  e. Do not put the bed back into service until it is completely dry, tested, and found to be safe to operate.

CAUTION:

To help prevent equipment damage, obey these **cautions**:

- **Caution—**Do not steam clean or power wash the bed. Pressure and excessive moisture can damage the protective surfaces of the bed and its electrical components.
- **Caution—**Do not use harsh cleansers/detergents, heavy duty grease removers, solvents such as toluene, xylene, or acetone, and do not use scouring pads (you may use a soft bristle brush).
- **Caution—**Do not use bleach as your primary everyday cleaner/disinfectant.
- **Caution—**Fully extend the foot section prior to the cleaning and disinfection process.

RECOMMENDATIONS

For proper cleaning and disinfection, staff members should be trained.

The **trainer** should carefully read the instructions and follow them when the **trainee** is being trained. The trainee should:

- Be given time to read the instructions and to ask any questions.
- Clean and disinfect the product while the trainer supervises. During, and/or after this process, the trainer should correct the trainee of any differences from the instructions for use.

The trainer should supervise the trainee until the trainee can clean and disinfect the bed as instructed.

Hillrom recommends to clean and disinfect the bed and mattress before first use, between patient use, and regularly during extended patient stays.

Some fluids used in the hospital environment, such as iodophor and zinc oxide creams, can cause permanent stains. Remove temporary stains by wiping vigorously with a lightly-dampened wiping cloth.

CLEANING AND DISINFECTION

Cleaning and disinfection are distinctly different processes. Cleaning is the physical removal of visible and non-visible soil and contaminants. Disinfection is intended to kill microorganisms.

Recommended Cleaning/Disinfectants Solutions

Chemical Class	Active Ingredient
Quaternary ammonium chloride	Didecyl dimethyl ammonium chloride Alkyl dimethyl benzyl ammonium chloride
Quaternary ammonium chloride	Alkyl dimethyl benzyl ammonium chloride Alkyl dimethyl ethylbenzyl ammonium chloride
Chlorine releasing agent (bleach)	Sodium Dichloroisocyanurate
Alcohol	Isopropyl alcohol

NOTE:
Bleach is not recommended as the primary cleaner/disinfectant. **Remove any disinfectant residue prior to and after the use of bleach** with a new or clean cloth/wipe soaked in tap water.

When you perform the detailed cleaning steps, please note the following:

- A reusable or disposable microfiber cloth or a Dispatch® Hospital Cleaner Disinfectant Towels with Bleach is recommended as the wiping cloth.
- Always replace the wiping cloth when visibly soiled.
- Always replace the wiping cloth between steps (spot clean, clean, and disinfect).
- Always use Personal Protective Equipment (PPE).
- Adjust the bed position, siderails, headboard, and footboard as needed for ease of cleaning and disinfection.

PREPARE THE BED FOR CLEANING AND DISINFECTING

1. Fully extend the foot section.
2. Unplug the bed.

STEP 1: Cleaning

a. As necessary, first remove visible soil from the bed and the mattress using a wiping cloth soaked with a recommended cleaner/disinfectant (see "Recommended Cleaning/Disinfectants Solutions" on page 29).

- Give special attention to seams and other areas where soil may accumulate.
- A soft bristle brush may be used to loosen hardened soil.
- Use as many wiping cloths as needed to remove the soil.

NOTE:
If desired, the mattress cover may be removed and laundered to remove visible soil. See "Laundry Guidelines" on page 30.

It is important to remove all visible soil from all areas before continuing to remove non-visible soil.

b. With a new or clean wiping cloth soaked in a recommended cleaner/disinfectant, use firm pressure to wipe all surfaces of the bed and mattress (including laundered covers). Use a new or clean wiping cloth as often as necessary. Make sure the following items are cleaned:
   - Siderails
   - Headboard and footboard
   - Areas between the footboard and mattress, headboard and mattress, and siderails and mattress
   - Upper frame
   - Base frame
   - Power cord
   - Caregiver pendant (hand-held) and pendant cord
   - Accessories
   - Mattress—top and bottom

NOTE:
Clean the mattress.

c. Examine the following for damage:
   - Top mattress cover
   - Bottom mattress cover
   - Zipper closure

d. If any of these items are damaged, replace the mattress. See "Compatible Mattresses from Hillrom" on page 22.

STEP 2: Disinfection

a. With a new or clean wiping cloth soaked in a recommended cleaner/disinfectant, use light pressure to wipe all exterior surfaces of the bed previously cleaned.

b. Make sure all surfaces **remain wet with the cleaner/disinfectant** for the **specified contact time. Re-wet** surfaces with a new or clean wiping cloth as necessary.

NOTE:
If bleach is used with another cleaner/disinfectant, use a new or clean cloth/wipe soaked in tap water to remove any disinfectant residue prior to and after the bleach application.

Prepare the Bed for Use

a. Connect the mattress retainers at the foot ends of the mattress.

b. Plug the bed into an applicable power outlet.

LAUNDRY GUIDELINES

Machine wash the top cover as follows:

a. Unzip and remove the top cover from the mattress.

b. Machine wash the top cover per facility protocol. Let the top cover rinse thoroughly in clean water.

Use the lowest temperature setting of the dryer to dry the top cover. Do not use high temperatures.

MAINTENANCE

WARNING:

Warning—Only facility-authorized persons should service the bed. Service by unauthorized persons could cause injury or equipment damage.

Do annual preventive maintenance to make sure all bed functions operate correctly. Pay particular attention to safety features, that include, but are not limited to these:

- Siderail latching mechanisms
- Caster braking systems
- Electrical cords and components
- Control function operation
- Lockout function operation
- Battery backup
- CPR release

PARTS AND ACCESSORIES

WARNING:

Warning—Do not modify the bed without authorization from Hillrom. Injury or equipment damage could occur.

Use only Hillrom parts and accessories. Do not modify the bed system without authorization from Hillrom.

DECOMMISSIONING AND DISPOSAL INSTRUCTIONS

Customers should adhere to all federal, state, regional, and/or local laws and regulations as it pertains to the safe disposal of medical devices and accessories. If in doubt, the user of the device shall first contactHillrom Technical Support for guidance on safe disposal protocols.

- In order to ensure the safe handling and disposal of this product, follow all relevant warnings provided in the service manual regarding possible causes of injury when decommissioning a bed.
    - Always ensure that the bed is unplugged before decommissioning.
- The bed and its accessories should be cleaned and disinfected, as described in the instructions for use, before any other decommissioning activities.
- If the decommissioned bed or accessory is still fit for use, Hillrom recommends donating the decommissioned bed and accessories to a charitable organization so that they can be reused.
- If the decommissioned bed or accessory is not fit for use, Hillrom recommends dismantling the bed in accordance with the instructions provided in the service manual. Hillrom recommends that all oil and hydraulic fluids are removed from the product before recycling or disposal, if applicable.
- Always check and comply with all local and national regulations and facility protocols when decommissioning a product.

Batteries should be recycled. Never dispose of batteries which contain substances that can be dangerous for the environment and health.

Other components, such as electronic components, plastics and metals, are recyclable in many local jurisdictions. Hillrom recommends recycling all components that can be recycled locally.

Components which cannot be recycled can be disposed of via standard waste disposal procedures.

EXPECTED LIFE

The expected life of a Centuris™ Bed System is 10 years of normal use provided that recommended preventive maintenance is performed by the facility.

Certain components have a shorter life cycle and will need to be replaced in order for the bed to meet its expected life. These components are:

- Bed batteries—3 year life expectancy
- Mattresses—See the instructions for use for each mattress for its life expectancy

TROUBLESHOOTING

Issue	**Do this:**
The bed overheats or shuts down after extensive operation.	The bed protects itself from overheating. To help make sure overheating does not occur, during clinical tasks, do not operate the functions more than necessary. If the bed shuts down after an extensive operation, do as follows: 1. Unplug the bed from its power source. 2. Let the bed cool for 20 minutes. 3. Plug the bed into an applicable power outlet. If the problem still continues, call Hillrom Technical Support.
The Lockout indicator flashes continuously when a control is activated.	When a control is activated and an abnormal voltage drop is detected, all articulation functions are locked from use. The Lockout indicator flashes continuously. Inform facility-authorized persons to perform troubleshooting. If the problem still continues, call Hillrom Technical Support.

TECHNICAL SPECIFICATIONS

Product Identification

Product Number	Description
P750	Centuris™ Bed System

Dimensions

Feature	Dimension
Length—fully retracted	220 cm
Length—fully extended	230 cm
Sleep deck length	196 cm
Minimum width—with siderails raised	100 cm
Maximum width—with siderail stored	105.5 cm
Sleep deck width	86.4 cm
Maximum head end panel height	40 cm
Minimum underbed clearance	13.5 cm
Wheel base	155 cm
Caster size	12.5 cm
Maximum weight—no surface or accessories	150 kg
Recommended dimensions for the mattress (see "Mattress" on page 22):	
Mattress width (minimum)	90 cm
Mattress width (maximum)	90.2 cm
Mattress length (minimum)	198 cm
Mattress length (maximum)	203.2 cm
Mattress thickness (minimum)	14 cm
Mattress thickness (maximum)	15.2 cm

Specifications

Feature	Dimension
Head section inclination (maximum)	65°
Knee section inclination (maximum)	25°
Sleep deck height range	46.5 cm to 76.5 cm
Trendelenburg position (maximum)	12°
Reverse Trendelenburg position (maximum)	12°
Bed lift capacity (maximum safe working load)	204 kg
Maximum height of seat section (in Trendelenburg position)	59 cm

Environmental Conditions for Transport and Storage

Condition	Range
Temperature	-40°C to 70°C ambient temperature
Relative humidity (RH)	20% to 95%, non-condensing
Pressure	50 kPa to 106 kPa

Environmental Conditions for Use

Condition	Range
Temperature	5°C to 40°C ambient temperature
Relative humidity (RH)	30% to 90%, non-condensing
Atmospheric pressure	70 kPa to 106 kPa

Mains Power Requirements

Condition	Range
Rated voltage	230 V 120 V
Maximum input current	230 V—2 A 120 V—2A/3A (Refer to product label)
Frequency	230 V—50/60 Hz 120 V—60 Hz

Battery Specifications

Condition	Range
Maximum battery life, with no functions operated and the bed unplugged from its power source	1 week
Time necessary to recharge a fully discharged battery	12 hours

Classification and Standards

Technical and Quality Assurance Standards	IEC/EN 60601-1 IEC/EN 60601-1-2 IEC/EN 60601-1-6 IEC/EN 60601-1-9 IEC/EN 60601-2-52 IEC/EN 62304 IEC/EN 62366-1 ISO/EN ISO 13485
Equipment classification per EN 60601-1	Class I equipment, internally powered equipment
Degree of protection against electric shock per EN 60601-1	Type B
Mode of operation (Bed articulation)	Continuous operation with intermittent loading, 2 minutes ON / 18 minutes OFF

Application Environments:	Environments 1 and 2 as per EN and IEC 60601-2-52
Classification according to European Union Medical Device Regulation (EU) 2017/745	Class I
Degree of protection against the presence of flammable anesthetic mixtures	Not for use with flammable anesthetics.
IPX classification	IPX4—According to IEC 60529, rating for protection against fluid ingress and identified as equipment that is protected against unpressurized spraying and splashing water.
Sound level	≤ 65 dBA

Electromagnetic Compatibility

Medical electrical equipment needs special precautions regarding electromagnetic compatibility (EMC) and needs to be installed and put into service according to the EMC information provided in this user manual.

Portable and mobile radio frequency (RF) communications equipment can affect medical electrical equipment.

CAUTION:

Caution—This device meets all requirements for electromagnetic compatibility per IEC 60601-1-2. It is unlikely that the user will encounter problems with this device because of inadequate electromagnetic immunity. However, electromagnetic immunity is always relative, and standards are based on anticipated environments of use. If the user observes unusual device behavior, particularly if such behavior is intermittent and associated with nearby use of radio or TV transmitters, cell phones, or electro-surgical equipment, this could be an indication of electromagnetic-interference. If such behavior occurs, the user should try to move the interfering equipment further from this device.

WARNING:

To help prevent injury and/or equipment damage, obey these **warnings**:

- **Warning**—Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the P750 including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.
- **Warning**—The use of parts and cables other than those specified by manufacturer as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY.
- **Warning**—The P750 should not be used adjacent to or stacked with other equipment. If adjacent and stack are necessary, observe the P750 and the other electrical equipment to make sure they operate as intended.
- **Warning**—If P750 is found to cause radio interference or disrupt the operation of nearby equipment, it may be necessary to take mitigation measures, such as re-orienting or relocating the device or shielding the location.

NOTE:

The emissions characteristics of P750 make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) P750 might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

Electromagnetic Emissions Guidance

Guidance and Manufacturer's Declaration—Electromagnetic Emissions		
The P750 is intended for use in the electromagnetic environment specified below. The customer or the user of the P750 should make sure it is used in such an environment.		
Emissions Test	**Compliance**	**Electromagnetic Environment—Guidance**
RF Emissions CISPR 11	Group 1	The P750 uses RF energy only for its internal functions. Therefore, its RF emissions are low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The emissions characteristics of P750 make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) P750 might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/ Flicker Emissions IEC 61000-3-3	Complies	

Electromagnetic Immunity Guidance

Guidance and Manufacturer's Declaration - Electromagnetic Immunity		
The P750 is intended for use in the electromagnetic environment specified below. The customer or the user of the bed should make sure it is used in such an environment.		
Immunity Test	**IEC 60601-1-2 Test Level**	**Compliance Level**
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 KV air	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 KV air
Radiated RF EM fields IEC 61000-4-3	3V/m 80MHz-2.7GHz; 80% AM at 1kHz	3V/m 80MHz-2.7GHz; 80% AM at 1kHz
Electrical fast transient/burst IEC 61000-4-4	± 2 kV 100 kHz repetition frequency	± 2 kV 100 kHz repetition frequency
Surge IEC 61000-4-5	±0.5kV, ± 1 kV Line to Line ±0.5kV, ±1kV, ± 2 kV Line to Ground (Earth)	±0.5kV, ± 1 kV Line to Line ±0.5kV, ±1kV, ± 2 kV Line to Ground (Earth)
Conducted disturbances induced by RF fields IEC 61000-4-6	3V 0.15MHz-80MHz 6V in ISM and amateur radio bands between 0.15MHz and 80MHz 80% AM at 1kHz	3V 0.15MHz-80MHz 6V in ISM and amateur radio bands between 0.15MHz and 80MHz 80% AM at 1kHz
Voltage dips, short interruptions, and variations on power supply lines IEC 61000-4-11	0% U_T: 0.5 cycle[a] At 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315° 0% U_T: 1 cycle 70% U_T: 25/30 cycles Single phase: at 0° 0% U_T: 250/300 cycles	0% U_T: 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315° 0% U_T: 1 cycle 70% U_T: 25/30 cycles Single phase: at 0° 0% U_T: 250/300 cycles

Guidance and Manufacturer's Declaration - Electromagnetic Immunity		
The P750 is intended for use in the electromagnetic environment specified below. The customer or the user of the bed should make sure it is used in such an environment.		
Immunity Test	**IEC 60601-1-2 Test Level**	**Compliance Level**
Power frequency (50/60hz) magnetic fields IEC 61000-4-8	30 A/m	30 A/m

a. UT is the AC mains voltage prior to application of the test level.

Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communications equipment

Test Frequency (MHz)	**Band (MHz)**	**Service**[a]	**Modulation**[b]	**Maximum Power (W)**	**Distance (m)**	**Immunity Test Level (V/m)**	**Compliance Level**
385	380-390	TETRA 400	Pulse Modulation 18 Hz	1.8	0.3	27	27
450	430-470	GMRS 460, FRS 460	FM[c] ±5kHz deviation 1 kHz sine	2	0.3	28	28
710	704-787	LTE-Band 13, 17	Pulse Modulation 217 Hz	0.2	0.3	9	9
745							
780							
810	800-960	GSM 800/900, TETRA 800, Iden 820, CDMA 850, LTE Band 5	Pulse Modulation 18 Hz	2	0.3	28	28
870							
930							
1720	1700-1990	GSM 1800, CDMA 1900, GSM 1900, DECT, LTE Band 1, 3, 4, 25, UMTS	Pulse Modulation 217 Hz	2	0.3	28	28
1845							
1970							
2450	2400-2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse Modulation 217 Hz	2	0.3	28	28
5240	5100-5800	WLAN 802.11, a/n	Pulse Modulation 217 Hz	0.2	0.3	9	9
5500							
5785							

a. For some services, only the up-link frequencies are included.
b. The carrier shall be modulated using a 50% duty cycle square wave signal.
c. As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

NOTES: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