Joerns

User-Service Manual

Joerns® Advanced Surfaces

Dolphin Fluid Immersion Simulation® System, Dolphin Pediatric Fluid Immersion Simulation® System

To avoid injury, read user's manual before using.

*Representative image of the Dolphin Fluid Immersion Simulation System.

Important Precautions

Important Notice: The Dolphin Fluid Immersion Simulation systems are medical devices and as such the equipment must be installed and operated in the manner for which it was intended. Facility staff/user is responsible for reading and understanding the product user manual and contacting Joerns Healthcare if anything in this manual is unclear. Joerns will not be held responsible for any injuries resulting from failure to comply with the instructions and precautions in this manual.

⚠**Warning:** Joerns specialty support surfaces are designed as mattress replacement systems. The risk of entrapment may occur when the equipment is placed on bed frames that leave gaps of even a few inches between the mattress and the head panel, foot panel, and bed or side rails. The equipment is NOT to be used when such gaps are present.

Facility staff/user is responsible for ensuring that all mattresses properly fit the bed frames. Joerns is not responsible for the placement of its equipment on bed frames that leave gaps between the mattress and the head panel, foot panel or bed or side rails which present a risk of harm to patients.

⚠**Warning:** An optimal bed system assessment should be conducted on each patient by a qualified clinician or medical provider to ensure maximum safety of the patient. The assessment should be conducted within the context of, and in compliance with, the state and federal guidelines related to the use of restraints and bed system entrapment guidance, including the *Clinical Guidance for the Assessment and Implementation of Side Rails* published by the Hospital Bed Safety Workgroup of the U.S. Food and Drug Administration. Further information can be obtained at the following web address: http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/GeneralHospitalDevicesandSupplies/HospitalBeds/default.htm.

When using the mattress system, always ensure that the patient is positioned properly within the confines of the bed. Do not let any extremities protrude over the side or between the bed rails when the mattress is being used.

⚠**Danger Explosion Hazard:** Do not use in the presence of flammable anesthetics. Do not use in the presence of smoking materials or open flame. Air flowing through the air mattress will support combustion.

⚠**Danger:** To reduce the risk of shock, adhere to the following instructions. Failure to do so could result in personal injury or equipment damage.

- Immediately after using the Dolphin Fluid Immersion Simulation System, unplug it from its power source.
- Do not place or store the product where it can fall or be pulled into a tub or sink.
- Do not place or drop the product into water or other liquid.
- Do not open the control unit. Refer servicing to Joerns.

⚠**Warning:** To reduce the risk of burns, shock, fire, or personal injury, adhere to the following instructions. Failure to do so could result in personal injury or equipment damage.

1. Use this product only for its intended purpose as described in this manual. Only use attachments and/or accessories that are recommended by the manufacturer.
2. If this product has a damaged power cord or plug, is not working properly, has been dropped or damaged, or has been dropped into water, do not operate it. For examination and repair, return the product to Joerns.
3. Keep the control unit and power cord away from heated surfaces, e.g. space heaters.
4. Never block the air openings of the product. Do not place the control unit on a surface, such as a bed or couch, where the air opening and/or filter compartment, located on the back of the control unit, may be blocked. Keep the air openings free of lint and hair.
5. Never drop or insert any object into any opening or hose.
6. Do not spill food or liquids onto the control unit. If a spillage does occur, turn off the unit, disconnect it from its power supply and allow at least 24 hours for drying.
7. Use of the Dolphin system outdoors requires proper protection for the Control Unit. It should be shielded from moisture and contained. The use of the optional Transport Carrying Bag is recommended. Do not use the product where aerosol-spray products are used.
8. Plug this product only into a properly grounded outlet. Refer to “Grounding Instructions”.

9. Ensure nothing is placed on the power cord and ensure it is not located where it can be stepped on or tripped over.
10. Do not attempt to service the control unit. Please call Joerns for any service requests.
11. The therapy pad (top cover) of this product is not air permeable and may present a suffocation risk. It is the responsibility of the caregiver to ensure that the patient can use this product safely.

Save These Instructions for Future Reference

Bed System Entrapment Information

In April 1999, the U.S. Food and Drug Administration (FDA) in partnership with representatives from the hospital and post-acute bed industry, including Joerns Healthcare, national healthcare organizations, resident advocacy groups, and other federal agencies formed the Hospital Bed Safety Workgroup (HBSW). The workgroup's goal is to improve the safety of bed frames for residents and patients in all health care settings who are most vulnerable to the risk of entrapment. The efforts of the FDA and the HBSW culminated in the FDA's release of recommended guidelines intended to reduce the risk of entrapment, including dimensional limits for critical gaps and spaces between bed system components and clinical guidance for assessment and implementation of bed side rails in various health care settings.

Entrapment zones involve the relationship of bed components often directly assembled by the healthcare facility rather than the manufacturer. Therefore, compliance is the responsibility of the facility.

As the leading manufacturer of long-term care beds and a frontrunner in addressing this critical issue, Joerns can offer you the expertise, assistance and products to bring your facility into compliance.

Joerns® Compliance Solutions

Matching the right bed components in order to meet regulatory guidelines can be complex.

That is why Joerns offers a wide array of compliance options. We assist customers in selecting compliant accessories recommended for their specific bed model.

Creating a Safer Care Environment

While the guidelines apply to all healthcare settings (hospitals, nursing homes and home care), long-term care facilities have particular exposure since serious entrapment events typically involve frail, elderly or dementia residents.

For More Information

To learn more about compliance options with Joerns products, visit our website at www.joerns.com, or contact our Customer Care representatives at 800.826.0270 and ask for free informational publications.

To learn more about entrapment zones, assessment methods, and guidelines concerning entrapment, contact Joerns at 800.826.0270 or consult the FDA website: http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/GeneralHospitalDevicesandSupplies/HospitalBeds/default.htm.

Table of Contents

Important Precautions **2**
Introduction **5-6**
Shear and Friction Reduction
Indications for use **6**
Spinal Cord Injury
Pressure Redistribution
Pain Management
Features **6-7**
Therapy Control Unit Features
Therapy Mattress and Specialty Surface Features
Therapy Pads
Additional Features **7-8**
CPR
Battery Back Up
Transport
Keyboard Functions **8**
Grounding Instructions **10**
Setup **11**
Therapy Mattress
Specialty Surface - Wheelchair Cushion
Troubleshooting **12**
Therapy Surface Not Inflating
Unable to Change Therapy Mode or Adjust Comfort Control
Nursing Procedures **12-13**
Recommended Linen
Changing the Therapy Pad
Patient Positioning and Comfort
Incontinence
Safety Information **13**
Patient Migration
Traction
Skin Care
Bed Height
Cleaning **13-14**
Control Unit
General Cleaning
Disinfecting
Therapy Pad
Steam Cleaning
Maintenance **14**
Storage and Care **15**
Control Unit
Therapy Mattress and Specialty Surface
System Specifications **15**
Weight
Safe Working Load
Dimensions
Electrical Specifications
Environmental Conditions
Control Unit Agency Approvals
Call for Assistance **15**
Appendix A **16**
Warranty **20**

Introduction

The Dolphin Fluid Immersion Simulation® (FIS) System is an advanced therapy system designed to provide state-of-the-art pressure redistribution by simulating the effects of a body immersed in a fluid medium. The Dolphin System includes three key components: proprietary software containing the Dolphin FIS protocols, a microprocessor-containing Dolphin AutoVector® control module, and the Dolphin advanced support surface.

The Dolphin System automatically measures the specific anthropometric characteristics of the individual patient as they engage the support surface. Based on active feedback measurements, the Dolphin AutoVector control module monitors the support surface more than 100 times per second for any patient movement or surface changes. The system's software integrates this specific weight and body contour data and directs automatic adjustments to maintain an optimized three-dimensional support surface environment. The result is an individualized immersion profile, based on specific patient measurements and movements, that creates a near neutrally buoyant state on the support surface.

The Dolphin FIS System delivers many of the best elements of air-fluidized therapy such as three-dimensional volumetric engagement and the elimination of gradient shear forces, leading to positive outcomes for flaps, grafts, and pressure ulcers. The Dolphin technology provides minimal distortion to the body, while maintaining the normal orientation of bone, muscle, and subcutaneous tissue. The Dolphin FIS System has been demonstrated to reduce the risk of pressure ulcer formation as part of protocols for the prevention and treatment of pressure ulcers.

The Dolphin FIS System is designed as a therapeutic mattress system for patients weighing up to 1,000 pounds (454.5 Kg).[1] It is customizable to fit bed frames, including bariatric bed frames, up to 48 inches (122 cm) wide.

[1]Mattress weight capacity only; total weight must not exceed bed frame manufacturers' specified load capacity, and when paired with an appropriate surface.

[2]Stretcher surface weight capacity only; total weight must not exceed stretcher manufacturers' specified load capacity, and when paired with an appropriate surface.

[3]Wheelchair cushion weight capacity only; total weight must not exceed wheelchair manufacturers' specified load capacity, and when paired with an appropriate surface.

The Dolphin Pediatric FIS System is designed as a therapeutic mattress system for a specialty population weighing between 5 and 300 pounds (2.3 kg to 136 kg).[1]

The Dolphin FIS Stretcher Pad is designed for patients weighing up to 700 pounds (318.1 Kg).[2]

The Dolphin Wheelchair Cushion System is designed for patients weighing up to 250 pounds (113.6 Kg).[3]

⚠ **Warning:** The risk of entrapment can arise when equipment is placed on bed frames that leave gaps of even a few inches between the therapy mattress and the head panel, foot panel, and bed or side rails. The equipment is NOT to be used when such gaps are present. See "Important Precautions" section of this manual.

Joerns' Dolphin System is suitable for the treatment and prevention of all stages of pressure ulcers, for patients who have been assessed to be at risk for pressure ulcers, the complications of immobility and for patients with healing grafts and flap sites.

The Dolphin FIS System is quiet, comfortable and simple enough for single caregiver installation and operation. As the Dolphin System is self-monitoring, there is no need for direct intervention or manual entry to adjust comfort settings. The system allows manual adjustment of the comfort setting to accommodate patient preference. After manual adjustment, the Dolphin AutoVector Control Module will optimize the immersion profile automatically at the new comfort setting.

Additionally, the low friction surface materials coupled with the shear-reducing aspects of the FIS technology result in a surface system that effectively manages both vertical and horizontal shear forces, allowing the Dolphin FIS System to meet the comfort and clinical requirements of your patients up to 1,000 lbs. (454.5 Kg),[1] 700 lbs. (318.1 Kg),[2] 250 lbs. (113.6 Kg).[3]

We have ensured that the Dolphin FIS System addresses the three key areas in the treatment of compromised skin: pressure redistribution, reduction in friction and reduction in shearing forces.

Shear and Friction Reduction

Friction results when a patient's skin rubs against another surface. Shear injury occurs when the skin is stationary in relation to the support surface, while the underlying tissues and vessels are stretched and damaged. The exterior surface of the Dolphin FIS System therapy pad is constructed from a very smooth nylon fabric with low friction and low shear properties to protect the patient's skin from these damaging forces.

Indications for Use

Note: The selection of a pressure redistribution surface should be based on each individual patient's clinical condition, diagnosis and/or co-morbidities. The choice and use of a support surface is one factor in a holistic program of wound prevention and treatment.

Spinal Cord Injury

The Dolphin FIS System can be used for patients with spinal cord injury once the acute injury has been stabilized and these patients have been assessed and cleared by the appropriate physician. The Dolphin FIS System is not recommended for use by patients with unstable spinal fractures.

Pressure Redistribution

Amputations	Grafts
Burns	Neurology
Dermatology	Pressure Ulcers
Flaps	Rehabilitation

Pain Management

AIDS Arthritis Oncology

The Dolphin FIS System is a state-of-the-art pressure redistribution technology designed to alleviate vertical shear forces.

The therapy mattresses and specialty surfaces conform to the specific shape of the patient, minimizing soft tissue distortion, reducing ischial tuberosity penetration into muscle fascia, and promoting improved blood flow compared to traditional surfaces.

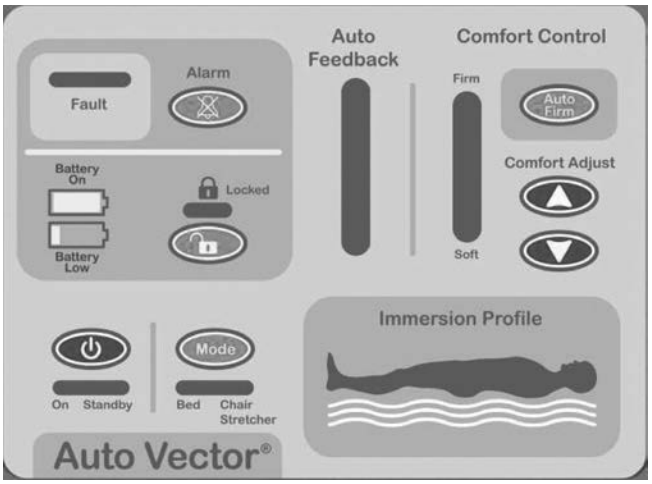

Figure 1

Note: Pressure redistribution and pain management are conditions and diagnoses for which the Dolphin FIS System may be indicated. Occasionally, there are orthopedic and neurological patients that require body positioning to be maintained in specific alignment. The use of the Dolphin FIS System for these patients should be considered on an individual basis and cleared by the attending physician.

Features

The Dolphin FIS System is comprised of two components:

- Therapy control unit
- Therapy mattress system or specialty surface (wheelchair cushion, stretcher pad)

Therapy Control Unit Features (Figure 1)

- Easy to read graphics for intuitive set up and therapy control.
- The *Bed* position operates the system when the patient is in a traditional healthcare bed. *Chair/ Stretcher* position can be used when the patient is on a smaller specialty surface; the timing cycle adjusts for use on the smaller surface (i.e. Dolphin Wheelchair Cushion).
- Requires no manual data input – automatically adjusts to patient's body weight and profile to create a neutrally buoyant, 3D support environment.
- A microprocessor and proprietary software analyzes the patient's shape in a 3D volumetric format.
- Continuously monitors the surface more than 100 times per second for any patient movement.

- **Joerns recommends that caregivers allow the Dolphin FIS System to set and control the immersion profile.** However, to accommodate individual patient preference, caregivers may use the *Comfort Adjust* arrows to manually adjust comfort settings. It is recommended that manual adjustments of more than one (1) LED step up or down from the system profile be avoided.
  Note: The Dolphin FIS System automatically adjusts the neutral buoyant immersion profile based on individual patient characteristics. The *Comfort Adjust* feature is designed to allow for individual patient comfort preferences. Should the patient request adjustment due to bed articulation, such as head of bed elevation, this may be accomplished by increasing the *Comfort Adjust* indicator up or down incrementally one LED. Care should be taken to minimize adjustments and allow the System to control the therapy surface's optimal profile.
  Note (applies to therapy mattress): If patient is over 250 lbs. (113.6 Kg), moving the *Comfort Adjust* indicator to one LED above the *Auto Feedback* LED may improve comfort. If patient is less than 100 lbs. (45.4 Kg), moving the *Comfort Adjust* indicator to one LED below *Auto Feedback* LED may improve comfort.
- *Autofirm* mode may be desirable for patient transfer and other patient care procedures. The system will automatically return to the previous setting after approximately 15 minutes.
- An alarm will sound and LED will illuminate in the event of a fault condition (see *Alarm* fault conditions; p.8).
- The rechargeable battery back-up will provide alternate power to the control unit for approximately 12 hours in the event that the system is disconnected or during a power failure. The battery will begin to recharge when power is restored.
  Note: The *Storage Switch* must be in the *Battery On* position to recharge.

[1]Mattress weight capacity only; total weight must not exceed bed frame manufacturers' specified load capacity, and when paired with an appropriate surface.

[2]Stretcher surface weight capacity only; total weight must not exceed stretcher manufacturers' specified load capacity, and when paired with an appropriate surface.

[3]Wheelchair cushion weight capacity only; total weight must not exceed wheelchair manufacturers' specified load capacity, and when paired with an appropriate surface.

Therapy Mattress System and Specialty Surface Features

- State-of-the-art pressure redistribution technology designed to alleviate vertical shear forces.
- Customizable therapy mattress that can fit any healthcare bed frame, including bariatric frames, up to 48" (122 cm) wide.
- Conforms to specific shape of the patient, minimizing soft tissue distortion, reducing ischial tuberosity penetration into muscle fascia, and promoting improved blood flow compared to traditional surfaces
- Able to accommodate patients up to 1000 lbs (454.5 Kg)[1] for therapy mattresses
- Able to accomodate patients 5 lbs to 300 lbs (2.3 kg to 136 kg)[1] for pediatric therapy mattress
- Able to accommodate patients up to 700 lbs (318.1 Kg)[2] for stretcher pad
- Able to accommodate patients up to 250 lbs (113.6 Kg)[3] for wheelchair cushion
- Quick CPR deflation valve on the therapy mattress
- **For Low Profile Therapy Mattress Models Only:** Contains a foam based safety cell to protect patients from bottoming out in the event of a power failure that exceeds battery life.
- **For V-Matt Therapy Mattress Models Only:** an air-filled safety cell to protect patients from bottoming out in the event of a power failure that exceeds battery life for step-deck bed frames.
- **For V-Matt Therapy Mattress Models Only:** CairEdge feature wraps around the bed frame edge at point of ingress/egress, providing extra padding.

Therapy Pad Features

- Constructed from smooth nylon fabric with low friction and low shear properties to protect the patient's skin from these damaging forces.
- Breathable, moisture vapor permeable fabric allows air to circulate beneath the pad and wicks away excess moisture. This helps to keep your patient dry and helps prevent skin maceration.

Additional Features

⚠ **Warning:** A possible fire hazard exists. This product is suitable for use with oxygen administering equipment of the nasal, mask, or half bed-length, tent-type only. To prevent personal injury or equipment damage, ensure that the oxygen tent does not extend below the mattress.

CPR

CPR deflation can be done by twisting the CPR valve. The therapy mattress will deflate rapidly (deflation time varies depending on patient weight and profile).

For V-Matt Therapy Mattress Models Only: For quick CPR deflation, locate the red CPR flag and twist the valve lightly. The mattress will rapidly deflate. **Note:** The safety cell will remain inflated.

Battery Back-up

A sealed 12 VDC rechargeable battery automatically provides all necessary power to the system when normal AC source is removed or fails for approximately 12 hours. The Dolphin FIS System will continue to provide therapy. This allows a patient to be moved freely without the AC cord being attached to an outlet. When reconnected to an AC source or power is restored, the AC section of the system automatically re-initializes and the battery is recharged.

Note: The *Storage Switch* must be in the *Battery On* position to recharge.

Transport

To transport the patient in bed, unplug the power cord from the main power outlet. Store the power cord in the space provided under the unit to avoid damaging the cord during transport. The battery back-up will provide power for continued therapy mattress system operation for approximately 12 hours.

Keyboard Functions

⚠**Warning:** For important precautions, see page two.

⚠**Caution:** The patient's head should be positioned in the center of the top section of the therapy mattress. When using the therapy mattress system, always ensure that the patient is positioned properly within the confines of the bed. Do not let any extremities protrude over the side or between the bed rails when the therapy mattress is being used. Joerns bed frames and therapy mattresses adhere to the FDA recommended guidelines for entrapment zones.

⚠**Caution:** For pediatric use, the patient should be positioned in the center of the therapy mattress with the length of the body parallel to the length of the mattress.

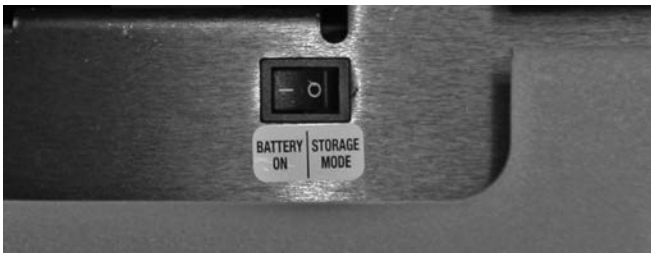

Figure 2

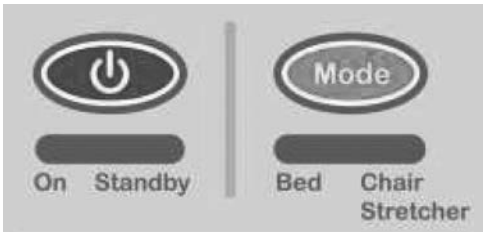

Figure 3

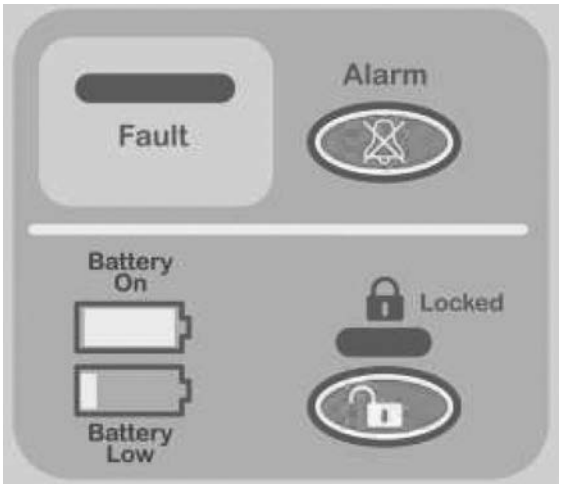

Figure 4

Storage Switch (Figure 2)
The *Storage Switch* is located on the bottom of the control unit by the power cord. Turn the *Storage Switch* to *Battery On* for normal operation of the control unit and to insure the battery charges when connected to AC power. Turn the *Storage Switch* to *Storage Mode* when the control unit will not be in use.

Power Button (Figure 3)
Use the *Power* button to turn the power on and off.

Mode (Figure 3)
The *Mode* should be set to Bed when the therapy mattress is in use regardless of the bed positioning. The Chair/Stretcher mode should only be selected when using a specialty surface.

In the *Bed* position, the system operates normally, but when switched to the *Chair/Stretcher* position, the timing cycles change to allow use on a specialty surface.

Using the specialty surface allows the system to be moved from the patient bed to a wheelchair cushion or stretcher pad, providing the normal functions of the system.

Alarm (Figure 4)
The warning or alarm subsystem consists of LED's and a beeper which displays red and beeps when a fault condition occurs.

A fault condition is considered to be any of the following conditions:
- Pressure too hard for more than a 10 second period
- Pressure too soft for more than a 10 minute period
- Differential error between "*Comfort Adjust* setting" and "*Auto Feedback*" for more than a 30 minute period

The beeper may be manually disabled for up to 30 minutes by pressing the yellow *Alarm* button.

This feature avoids annoyance while a fault is being corrected, but will automatically re-assert itself after 30 minutes time, or until the fault is corrected. The LED's continue to function normally, regardless of the *Alarm* on/off state.

Lock (Figure 4)
The *Lock* button and associated yellow LED permit the entire control panel to be locked from further adjustments.

When locked, pressing the *Lock* button again restores normal operation and the yellow LED is extinguished.

Battery Indicators (Figure 4)
The Battery indicator will blink when the AC power has been interrupted and the control unit is running on the battery back-up power.

The *Battery Low* indicator will blink when the battery back-up is at the end of its charge life. Plug control unit back into a power outlet as soon as possible to resume normal operation. Upon restoration of AC power, the battery back-up will begin the recharge process. **Note:** To ensure the battery recharges when connected to AC power, the *Storage Switch* must be in the *Battery On* position.

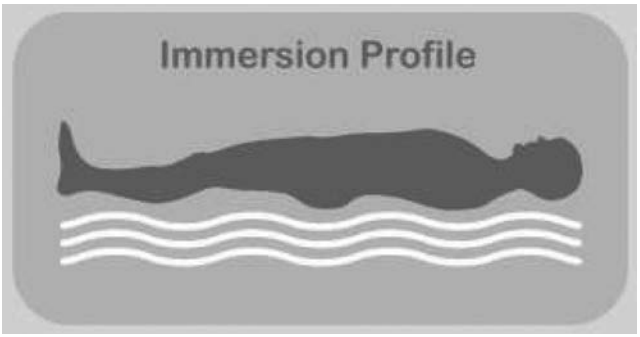

Figure 5

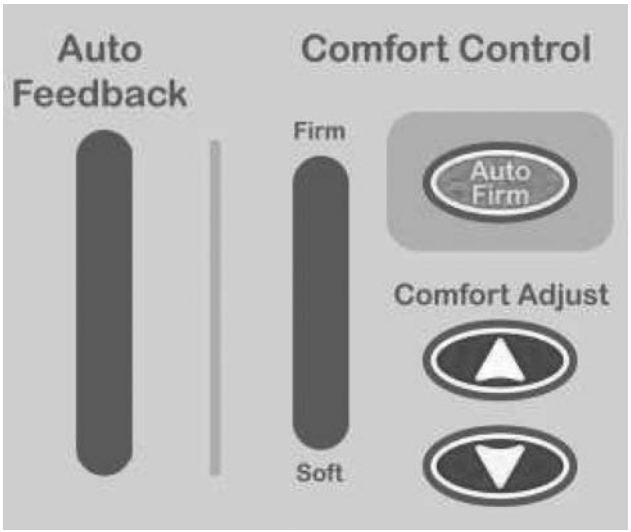

Figure 6

Immersion Profile Window (Figure 5)
The *Immersion Profile* indicates the system response to patient initial positioning and position change. When in optimal position, the green LED will illuminate. When the system is in transition, the yellow/red LEDs will illuminate. The Dolphin FIS System will recreate the optimal profile based on individual patient body characteristics. **No manual adjustment is needed**.

Comfort Controls (Figure 6)

Autofirm
The *Autofirm* mode is strictly used for patient transfers, repositioning and to quickly inflate the surface when it has not been in use.

⚠ **Caution:** The System should never be left in *Autofirm* mode while a patient is on the surface outside of transfers or repositioning. *Autofirm* is not a therapy mode.

To override the *Autofirm* mode, press the *Autofirm* button again.

The *Autofirm* button causes the therapy mattress or specialty surface to fill to maximum inflation. After 15 minutes, the system will automatically reset to the previous inflation level.

While in the *Autofirm* mode, the *Comfort Adjust* indicator LED will remain on its normal setting to show where the inflation will return upon resumption of normal operation. Also, the *Comfort Adjust* indicator will blink amber at the firm position when in *Autofirm* mode. There is no restriction against the user immediately returning to the *Autofirm* mode once leaving that mode.

The *Comfort Adjust* indicator indicates where the manual pressure adjustment is set by the *Comfort Adjust* arrows.

Comfort Adjust
Joerns recommends that caregivers allow the Dolphin FIS System to set and control the immersion profile. However, to accommodate individual patient preference, caregivers may use the *Comfort Adjust* arrows to manually adjust comfort settings. It is recommended that manual adjustments of more than one (1) LED step up or down from the system profile be avoided.

Note: The Dolphin FIS System automatically adjusts the neutral buoyant immersion profile based on individual patient characteristics. The *Comfort Adjust* feature is designed to allow for individual patient comfort preferences. Should the patient request adjustment due to bed articulation, such as head of bed elevation, this may be accomplished by increasing the *Comfort Adjust* indicator up or down incrementally one LED. Care should be taken to minimize adjustments and allow the System to control the therapy surface's optimal profile.

Auto Feedback
The *Auto Feedback* indicator scale is represented by 10 LED's and cover the full control range from *Soft* to *Firm*.

When operating within normal parameters, the *Auto Feedback* LED scale will be amber. Should the system be outside of normal parameters, the LED scale will move from amber to red, indicating a potential need to manually adjust with *Comfort Adjust* arrows.

It is normal for the *Auto Feedback* LED to move to red when the patient is transitioning on the therapy mattress. Allow the Dolphin FIS System to optimize. If the LED lights remain consistently red after the system has had the chance to optimize, manual adjustment with the *Comfort Adjust* arrows is needed.

Grounding Instructions

⚠**Warning:** Use a properly grounded, AC outlet for this product. Failure to use a grounded outlet could result in personal injury or damage to equipment or structure wiring, including risk of fire. A qualified electrician should be contacted to correct the wiring and ensure a properly grounded outlet.

Before installing this product, have the electrical system checked to make sure the electrical circuits and the electrical service are properly grounded. There is always a chance of a loose connection or poor installation of a ground wire that causes the loss of proper ground at the outlet. Inadequate grounding at electrical outlets can occur even if there is a ground wire. Wires can become loose over time at the connection to the outlet. **Note:** To install new wires on a circuit requires a qualified electrician.

How to Determine if Your Outlet has the Proper Grounding

Most hardware stores sell circuit testers that can be used to test an outlet for proper grounding. The tester plugs into an outlet and by observing the indicator lights you can determine if the outlet is properly grounded. For a higher level of assurance, an electrician should be requested to thoroughly test the electrical system with more reliable equipment.

If repair or replacement of the cord or plug is necessary, please contact Joerns Healthcare for assistance.

Setup

⚠**Warning:** For important precautions, see page two.

⚠**Caution:** Do not place the control unit on the floor. Position the power cord to prevent tripping hazards.

Therapy Mattress

- Remove the existing mattress from the bed.
- Unpack the therapy mattress with the hose connection at the foot end of the bed and the therapy cells facing up. Secure the therapy mattress straps to the movable part of the bed frame.
- If the therapy pad is not already on the therapy mattress, place it on the therapy mattress. Attach to the therapy mattress using either the straps or zipper depending on the mattress configuration.
- Hang the control unit on the foot of the bed facing away from the bed.
- Connect hose set from the therapy mattress to the control unit securely. When properly installed, the hose connectors should audibly click into place.
- Turn *Storage Switch* to *Battery On* position. The *Storage Switch* is located on the underside of the unit.
- Plug in the control unit and the yellow *Standby* light will illuminate. Press the *Power* button. The control unit will start and the green light will illuminate. Keep the control unit ON while the patient is on the therapy mattress.
- The control unit must be set to the *Bed* setting using the *Mode* button when connected to a therapy mattress. Use the *Chair/Stretcher* mode when the control unit is connected to a specialty surface.
- Inflate the therapy mattress using the *Autofirm* button. The therapy mattress is fully inflated when the immersion profile is indicated in green.
- Place the patient on the therapy mattress and allow system to optimize. **Note:** If patient is over 250 lbs. (113.6 Kg), moving the *Comfort Adjust* indicator to one LED above the *Auto Feedback* LED may improve comfort. If patient is less than 100 lbs. (45.4 Kg), moving the *Comfort Adjust* indicator to one LED below *Auto Feedback* may improve comfort.
- When the Dolphin FIS System is working properly, no hand check is normally recommended. If needed, a traditional hand check may be preformed as outlined below:
  1. Begin by placing the back section of the bed in the appropriate position based on the patient's clinical condition.
  2. Select the highest or most firm *Comfort Adjust* setting.
  3. Hand Check: Place a hand with three (3) fingers (if head of bed at 30° or higher) or four (4) fingers (if head of bed lower than 30°) stacked vertically beneath the cells of the mattress and above the safety mattress directly between the lowest point of the patient's sacral area/buttocks. The smallest finger should be resting on the safety mattress.
  4. Sequentially reduce the *Comfort Adjust* setting to the firmness level where the height of the three (3) or four (4) fingers can slide with minimal resistance between the patient's sacral area/buttocks and the lower safety mattress. This is the proper *Comfort Adjust* setting for the patient to assure proper inflation of the air cells and prevent bottoming out of the mattress.
  5. Document the patient's *Comfort Adjust* setting for future reference, and re-evaluate with the hand check as the patient's condition warrants.

Wheelchair Cushion

- Remove any existing cushion from the wheelchair.
- Unpack the wheelchair cushion with the hose connection at the back of the wheelchair and the therapy cells facing up. Secure the wheelchair cushion straps to the seat section of the wheelchair frame.
- If the therapy pad is not already on the wheelchair cushion, place it on the wheelchair cushion. Attach the zipper around the perimeter of the wheelchair cushion.
- Secure the control unit to the back of the wheelchair.
- Connect hose set from the wheelchair cushion to the control unit securely. When properly installed, the hose connectors should click into place.
- Turn *Storage Switch* to *Battery On* position. The *Storage Switch* is located on the underside of the unit.
- Press the *Power* button. The control unit will start and the green light will illuminate. Keep the control unit ON while the patient is on the wheelchair cushion. **Note:** The control unit battery must be periodically recharged. Follow instructions under Battery Indicators on page 8.
- The control unit must be set to the *Chair/Stretcher* setting using the *Mode* button when connected to a wheelchair cushion. Use the *Bed* mode when the control unit is connected to a therapy mattress.
- The wheelchair cushion is inflated and ready for use when the immersion profile is indicated in green.
- Place the patient on the wheelchair cushion and allow system to optimize.

Stretcher Pad

- Remove any existing pad from the stretcher
- Unpack the stretcher pad and place on the stretcher with the hose connection at the foot of the wheelchair. Use the hook and loop fastener on the underside of the pad to attach the pad to the stretcher by peeling off the outer layer of white tape and laying the pad firmly back on the stretcher.
- Secure the control unit to the stretcher using the hooks on the back of the unit.
- Connect the hose set from the stretcher pad to the control unit securely. When properly installed, the hose connectors should click into place.
- Turn *Storage Switch* to *Battery On* position. The *Storage Switch* is located on the underside of the unit.
- Press the *Power* button. The control unit will start and the green light will illuminate. Keep the control unit ON while the patient is on the stretcher pad. **Note:** The control unit battery must be periodically recharge. Follow the instructions under Battery Indicators on page 8.
- The control unit must be set to the *Chair/Stretcher* setting using the *Mode* button when connected to a stretcher pad. Use the *Bed* mode when the control unit is connected to a therapy mattress.
- The stretcher pad is inflated and ready for use when the immersion profile is indicated in green.
- Place the patient on the stretcher pad and allow the system to optimize.

Troubleshooting

Support Surface is Not Inflating

- Ensure the hose connection from the therapy mattress or specialty surface to the control unit is securely connected. When properly installed, the hose connectors should click into place.
- Ensure that the control unit is plugged into an AC outlet or that the control unit is operating on Battery Back-up.
- Ensure that the power is not on *Standby*. If on *Standby*, press the *Power* button.
- Ensure that all air cells are connected.
- Ensure that the *Mode* is in the appropriate position for the attached advanced support surface (i.e. *Bed* position for therapy mattresses).
- Ensure that the *Storage Switch* is turned to the *Battery on* position.
- Ensure that the CPR valve is closed.
- Ensure that the CPR flag plugs are inserted (if applicable).
- If the control unit runs constantly but cannot establish the optimized *Immersion Profile*; check for faulty connections, leaking surfaces, or damaged control unit.
- If the *Auto Feedback* indicator is always RED, check for proper surface inflation and unit operation.

Unable to Change Therapy Mode or Adjust Comfort Control

Make sure the *Lock* function is disabled. To disable, press the *Lock* button.

Nursing Procedures

Recommended Linen:

Special linens are not recommended for the Dolphin FIS therapy mattress. There is no need for a bottom sheet as the therapy pad should be covering the therapy cells at all times. The patient should never be lying or sitting directly on the therapy cells. Based upon the patient's specific needs, the following linens may be utilized:

- Draw or slide sheet to aid in positioning and to further minimize friction and shearing.
- Incontinence barrier pad for patients incontinent of urine and/or stool, and patients with heavily draining wounds.
- Add top sheet, blanket and/or bedspread as needed for patient comfort.
- Keep the amount of padding between the patient and therapy mattress or specialty surface to a minimum for optimum performance. Placing excessive pads or sheets between the patient and the therapy mattress or specialty surface may negatively impact performance.

Changing the Therapy Pad

- Place the therapy pad over the therapy cells, fitting the corner of the cushions into the corner of the therapy pad (similar to a fitted sheet).
- Secure the therapy pad over the therapy mattress or specialty surface tub.

Patient Positioning and Comfort

General Repositioning
Patients should be turned and repositioned per individual turning schedule or per facility policy. It may be helpful to activate the *Autofirm* mode to achieve a firm therapy mattress for repositioning purposes. The unit will automatically return to the mode it was in prior to *Autofirm* in approximately 15 minutes or you can manually return to therapy mode once patient has been repositioned.

Unless contraindicated, it is desirable to keep the back section of the bed in the flat position to provide optimal pressure redistribution and minimize the risk of shearing injuries.

Elevating Patient into Sitting Position
The special properties of the Dolphin FIS System therapy pad reduce the opportunity for shear and friction that may occur when raising the back section of other bed systems. As with any surface, sliding can be expected, therefore patients should be repositioned after elevation. The knee gatch or foot section of the bed may be elevated first, to help prevent the patient from sliding when the back section is elevated.

Incontinence

Moisture against the skin surface leads to maceration, or softening of the tissues. To prevent maceration, an incontinence barrier pad may be used to absorb the excess moisture.

In the event of incontinence or excess drainage on the therapy pad, the pad should be cleaned as recommended in the Cleaning section of this manual.

Safety Information

When using the Dolphin FIS System, always ensure that the patient is positioned properly within the confines of the bed or other specialty item. Do not let any extremities protrude over the side or between the bed rails when the mattress is being used.

Patient Migration

Specialty bed products are designed to reduce/redistribute pressure and the shearing/friction forces on the patient's skin. The risk of gradual movement and/or sinking into hazardous positions of entrapment and/or inadvertent bed exit may be increased due to the nature of these products.

Traction

With any traction equipment or unstable fractures, maintain physician-directed angle of articulation and guard against risks of patient migration or inadvertent deflation of patient surface.

Skin Care

Monitor skin conditions regularly, particularly in areas where incontinence and drainage occur or collect, and consider adjunct or alternative therapies for high acuity patients. Early intervention may be essential to preventing serious skin breakdown.

Bed Height

To minimize the risks of falls or injury, the patient surface should always be in the lowest practical position when the patient is unattended. Make sure areas under and around the frame are clear of objects, persons and parts of body before adjusting height.

Cleaning

⚠ **Warning:** Unplug the control unit from its power source. Failure to do so could result in personal injury or equipment damage.

⚠ **Warning:** Do not expose the unit to excessive moisture that would allow for liquid pooling. Personal injury or equipment damage could occur.

⚠ **Caution:** Do not use harsh cleansers/detergents, such as scouring pads and heavy-duty grease removers, or solvents, such as acetone. Equipment damage could occur.

Control Unit

Wipe off dust. If necessary, clean the housing exterior with a disinfectant solution or a mild detergent and a damp cloth. Then wipe dry.

General Cleaning

If there is no visible soilage with possible body fluids, we recommend that you clean the therapy mattress and specialty surface with a mild detergent and warm water. If disinfection is desired, you may use a combination cleanser/disinfectant as explained in "Disinfecting" area.

- Patient care equipment that does not come in contact with mucous membranes or non-contact skin requires low-level disinfection. Wiping surfaces with a properly prepared detergent or disinfectant carries out low level disinfecting.
- Processing of dirty patient care equipment should take place in a designated area away from clean or sterile supplies and food preparation areas.
- Detergent/disinfectants should not be mixed with other germicides or detergents. Using the proper dilution ensures the most effective killing power of the disinfectant.
- Wash hands often and well, including after removal of gloves.
- Patient care equipment that is used in isolation areas should be disinfected in accordance with all internal policies and procedures regarding such equipment.

Disinfecting

When there is visible soilage and between patients, we recommend that you disinfect the unit and therapy mattress or specialty surface with a tuberculocidal disinfectant. Disinfectant should be registered with the Environmental Protection Agency (EPA).

- Use rubber gloves and eye protection.
- Prepare detergent/disinfectant (registered by EPA as hospital disinfectant) solution according to instructions on label for correct use-dilution.
- With the therapy mattress or specialty surface deflated, thoroughly wipe down entire mattress, as air cells will lie flat. Be sure to reach all areas underneath and in-between air cells. Allow to air dry.
- If dust or other soiling has accumulated along air hoses, remove using swabs moistened with detergent/disinfectant as necessary. Allow all components to air dry. Wrap therapy mattress or specialty surface in plastic and return to storage area.
- Thoroughly wipe down outside of control unit and allow to air dry. Cover with plastic and return to storage area.
- Remove gloves and dispose; wash hands.

Therapy Pad

The therapy pad can be wiped down with a disinfectant solution or a mild detergent with a damp cloth. If heavily soiled, the therapy pad can be laundered in a washer and dryer with warm water (no more than 120°F/48.9°C). A non-bleach detergent should be used sparingly. Wipe dry or allow to air dry.

Steam Cleaning

Do not use any steam cleaning device on the unit. Excessive moisture can damage mechanisms in this unit.

Maintenance

⚠**Warning:** Only facility-authorized personnel trained by Joerns Healthcare should perform preventative maintenance. Preventative maintenance performed by unauthorized personnel could result in personal injury or equipment damage.

Any maintenance done without Joerns's authorization will invalidate any warranties on this product.

[1]Mattress weight capacity only; total weight must not exceed bed frame manufacturers' specified load capacity, and when paired with an appropriate surface.

[2]Stretcher surface weight capacity only; total weight must not exceed stretcher manufacturers' specified load capacity, and when paired with an appropriate surface.

[3]Wheelchair cushion weight capacity only; total weight must not exceed wheelchair manufacturers' specified load capacity, and when paired with an appropriate surface.

Storage and Care

When the product is not in use, store the power cord properly. Failure to do so could result in personal injury.

Note: Clean the Dolphin FIS System as described in the previous section prior to storage.

Control Unit

The power cord may be stored in the space provided under the unit for convenience. Wrap the unit in a plastic bag for dust resistance then store the unit in an area appropriate for an electronic medical device. Turn the Storage switch to *Storage Mode* when not in use. The Storage switch is located at the underside of the unit.

Therapy Mattress and Specialty Surfaces

Gently roll up the therapy mattress or specialty surface, expelling any residual air, for temporary storage. The therapy mattress or specialty surface should be wrapped in plastic and/or a clean bag for storage.

System Specifications

Weight

Control Unit:.....10 lbs (4.5 Kg)
Therapy Mattress:.....22 lbs (10 Kg)
Stretcher Pad:.....14 lbs (6.3 Kg)
Wheelchair Cushion: .....5 lbs (2.3 Kg)

Safe Working Load

Therapy Mattress:
Maximum weight capacity[1]: .....1000 lbs (454.5 Kg)

Stretcher Pad:
Maximum weight capacity[2] .....700 lbs (318.1 Kg)

Wheelchair Cushion:
Maximum weight capacity[3] .....250 lbs (113.6 Kg)

Pediatric System:
Minimum weight capacity[1].....5 lbs (2.3 Kg)

Dimensions

Control Unit:
11.5" (29.2 cm) W x 12.5" (31.8 cm) H x 6" (15.2 cm) D

Standard Therapy Mattress:
35" (89 cm) W x 82" (208 cm) L x 10" (25 cm) D
42" (107 cm) W x 82" (208 cm) L x 10" (25 cm) D
48" (122 cm) W x 82" (208 cm) L x 10" (25 cm) D

Low Profile Therapy Mattress:
35" (89 cm) W x 82" (208 cm) L x 8" (20 cm) D
42" (107 cm) W x 82" (208 cm) L x 8" (20 cm) D
48" (122 cm) W x 82" (208 cm) L x 8" (20 cm) D

Step-Deck (Dolphin V-Matt):
35" (89 cm) W x 88" (224 cm) L x 10" (25 cm) D

Crib Therapy Mattress:
US: 29.5" (75 cm) W x 57" (145 cm) L x 5" (13 cm) D
Int'l: 28" (71 cm) W x 50" (128 cm) L x 4" (10 cm) D

Wheelchair Cushion:
17" (43 cm) W x 17" (43 cm) L x 4" (10 cm) D

Stretcher Pad:
36" (91 cm) x 76" (193 cm) x 5" (13 cm)

Electrical Specifications

90/240 VAC, 50/60 Hz

Environmental Conditions

Operating Conditions:
Ambient Temperature: +10°C to +40°C
Relative Humidity: 30% to 75% Non-Condensing

Storage and Shipping Conditions:
Ambient Temperature: 10°C to +40°C
Relative Humidity: 10% to 100%

Control Unit Classifications

North America: UL 60601-1, CAN/CSA C22.2 No. 601.1

Europe: Conforms to IEC/EN 60601-1 and IEC/EN 60601-1-2 CE

Call for Assistance

If you have any questions or require service on a product, please call Joerns Healthcare at:
North America - 800.862.0270
Europe - (+31) 30.6363.700

Appendix A: Electromagnetic Compatibility (EMC) Information

AutoVector® Fluid Immersion Simulator

Medical Electrical Equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this manual.

Portable and mobile RF communications equipment can affect Medical Electrical Equipment.

The use of Accessories, transducers, and cables other than those specified by the manufacturer, may result in increased Emissions or decreased Immunity of the Auto Vector Fluid Immersion Simulator.

The AutoVector Fluid Immersion Simulator should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, the Auto Vector Fluid Immersion Simulator should be observed to verify normal operation in the configuration in which it will be used.

Guidance and Manufacturer's Declaration –Electromagnetic Emissions		
The AutoVector Fluid Immersion Simulator is intended for use in the electromagnetic environment specified below. The customer or the user of the Auto Vector Fluid Immersion Simulator should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The AutoVector Fluid Immersion Simulator uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The AutoVector Fluid Immersion Simulator 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.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	

Guidance and Manufacturer's Declaration - Electromagnetic Immunity:

The AutoVector® Fluid Immersion Simulator is intended for use in the electromagnetic environment specified below. The customer or the user of the Auto Vector Fluid Immersion Simulator should assure that it is used in such an environment.

Immunity Test	IEC60601 Test Level	Compliance	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%.
Electrical fast 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	Not applicable Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s) ±2 kV line(s) to earth	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 AutoVector Fluid Immersion Simulator requires continued operation during power mains interruptions, it is recommended that the Auto Vector Fluid Immersion Simulator be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A / m	Not applicable	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			
The AutoVector® Fluid Immersion Simulator is intended for use in the electromagnetic environment specified below. The customer or the user of the Auto Vector Fluid Immersion Simulator 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 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the Auto Vector Fluid Immersion Simulator, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80 MHz to 800 MHz $d=2.3\sqrt{P}$ 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). 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: 
Radiated 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 propagation 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 Auto Vector Fluid Immersion Simulator is used exceeds the applicable RF compliance level above, the Auto Vector Fluid Immersion Simulator should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Auto Vector Fluid Immersion Simulator. [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 Auto Vector Fluid Immersion Simulator

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

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d=1.2\sqrt{P}$	**80 MHz to 800 MHz** $d=1.2\sqrt{P}$	**800 MHz to 2,5 GHz** $d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

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.

Joerns

Joerns Healthcare Warranty Program

for Dolphin Fluid Immersion Simulation® System Advanced Support Surfaces

Joerns Healthcare warrants the Dolphin FIS System advanced support surfaces to be sold free from defects in workmanship and materials, under normal and proper use, for a period of two (2) years on the advanced support surfaces, and two (2) years on the electromechanical mattress components (compressors, valves, printed circuit boards, hoses, and couplers). Damages arising from improper use will not be covered by this warranty.

Improper use is defined as, but not limited to, those caused by:

- Burns
- Use of improper chemical agents
- Needle punctures, cuts, or abrasions
- Excessive loads
- Staining
- Negligent or excessive usage
- Improper maintenance, handling and/or cleaning
- Failure to use in the manner indicated in the Dolphin FIS System user manual

Any modification, repair or alteration done to the Dolphin FIS System that was not authorized in writing by Joerns Healthcare will void this warranty.

Damage caused by use in unsuitable environmental conditions, abuse or failure to maintain the product in accordance with user and service instructions is not covered.

This warranty is extended to the original purchaser of the equipment.

Parts

Joerns' Dolphin FIS System contains various parts that wear from normal use. Joerns Healthcare's obligation under this warranty is limited to supplying replacement parts, servicing or replacing, at its option, any product which is found by Joerns to be defective. When requested by Joerns, parts must be returned for inspection at the customer's expense. Credit will be issued only after inspection.

Service

Most service requests can be handled by the facility Maintenance Department with assistance from the Joerns Healthcare Product Service Department.

Most parts requested can be shipped next day air at the customer's expense.

Should a technician be required, one will be provided by Joerns Healthcare, at our discretion. Only the Joerns Healthcare Product Service Department can dispatch authorized technicians.

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