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Technical Support

Technical assistance is available Monday through Friday, 8:00 am to 6:00 pm (Eastern Standard Time).

Phone: 800-659-5922
Fax: 704-583-8506
General Information

Definitions of Symbols

The following symbols may be used throughout the product manual:

- **CAUTION.** Failure to carefully follow the described procedure may result in damage to the equipment.
- **WARNING.** Failure to carefully follow the described procedure may result in damage to the equipment and the operator.
- Risk of electrical shock present. Make sure power is disconnected before attempting this procedure.

IEC Symbols

The following symbols conform to IEC labeling standards and may be located throughout the product:

- AC (Alternating Current)
- Protective earth (Ground)
- Attention: Consult accompanying documents
- OFF
- ON
- Type B equipment
  (Protected against electrical shock)
- Dangerous voltage

All fuses are labeled at point of use. Replace fuses only with type and rating as indicated.

maximum weight capacity 400 lbs.

<table>
<thead>
<tr>
<th>Volts</th>
<th>Cycles</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spirit 1800 Chair: 115 VAC 60 HZ 8 A ~</td>
<td></td>
<td></td>
</tr>
<tr>
<td>230 VAC 50 HZ 4 A ~</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermittent 5% Duty Cycle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IEC Medical Device Classification

| Classification: | 1 |
| Type: | B |
| Operation Mode: | Intermittent |

Product Disposal

Contact your local authorized dealer for proper disposal of the device to ensure compliance with your local environmental regulations.

Interference with Electromedical Devices

To guarantee the operational safety of electromedical devices, it is recommended that the operation of mobile radio telephones in the medical practice or hospital be prohibited.

Strong EMI sources such as electro surgery units or x-ray units may affect performance. If performance problems occur, move the unit to another electrical circuit or physical location.

Incompatible Units or Accessories

To guarantee the operational safety and function of this device, the use of unapproved unit or accessories is not advised. Doing so could result in potential hazard.

WARNING:

To avoid possible injury and/or damage to the chair, do not allow patient to sit on the toeboard. Doing so may cause the chair to tip.

Obtaining Technical Literature

The manufacturer will make available on request circuit diagrams, component parts lists, descriptions, calibration instructions or other information that will assist technical personnel to repair and replace serviceable items.

Authorized European Representative:

Medical Device and QA Services
76, Stockport Road
Timperley, Cheshire WA15 7SN  U.K.

WARNING: Only authorized service technicians should attempt to service this equipment. Use of other than authorized technicians will void the warranty.
Regulatory Information

Technical Description

The dental chair is used to position the patient so that the oral cavity is in the desired position for the dentist to perform various dental procedures. Dental chairs can be either hydraulically or electromechanically operated. There are two dynamic functions: the base (up/down) and the back (incline/recline). These functions are activated by use of either a footswitch or a hand-operated touch pad.

The dental chairs have the provision to mount additional dental equipment including over-the-patient delivery systems. For this purpose the chair must provide a stable foundation for both the patient and the additional equipment.

Power to the chair is either 115 or 230 volts. The power is delivered to a microprocessor controlled printed circuit board. Software in the microprocessor controls the movement of the chair. The dentist can program some chair models to preset positions.

The dental chair is classified as a Class I product under rule 1 of Annex IX of the MDD 93/42/EEC; accordingly, the provisions of Annex VII apply.

Safety and Identification Markings

The following product labels appear on the dental chair. They may aid in identifying the chair’s model and serial numbers as well as cautionary statements.

Identification Labels
(115V and 230V models)

Safety Labels

DANGER: RISK OF EXPLOSION IF USED IN THE PRESENCE OF FLAMMABLE ANESTHETICS.

DANGER: RISQUE D’EXPLOSION EN PRESENCE DE PRODUITS ANESTHÉTIQUES INFLAMMABLES.

ATTENTION: ELECTRIC SHOCK HAZARD. DO NOT REMOVE COVER. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

ATTENTION: RISQUE D’ÉLECTROCUTION. NE PAS OUVRIR LE COUVERCLE. FAIRE APPEL À UN TECHNICIEN QUALIFIÉ.

WARNING: THIS DEVICE SHOULD ONLY BE CONNECTED TO HOSPITAL GRADE OUTLETS. FAILURE TO DO SO MAY RESULT IN ELECTRICAL SHOCK DUE TO IMPROPER GROUNDING.

ATTENTION: CET APPAREIL DOIT ÊTRE BRANCHE À UNE PRISE DE TERME ADEQUATE.
Cleaning and Disinfecting Dental Equipment

Infection control in the dental office continues to be a high priority for our customers and end users. OSHA, the ADA and the CDC are also involved in this complex issue.

The Manufacturer will not attempt to specify the required intervals for disinfection nor can it recommend the overall best surface disinfectant. Please refer to the Infection Control Recommendations published by the American Dental Association for further information. The question is often asked, “What should I use to disinfect my dental unit, chair and light?” This question is more complex than it seems because of the wide variety of products on the market as well as formulations of the products changing to meet the needs of increased asepsis.

**Barrier Technique**
The Manufacturer strongly advocates the barrier technique be used whenever possible to preserve the finish and appearance of the equipment.

Wherever possible disposable barriers should be used and changed between patients. The barrier technique will ensure maximum long term durability of the surfaces and finishes of the equipment.

**Chemical Disinfection**
Regardless of the chemical disinfectant used, it is imperative that the equipment be thoroughly washed with mild soap and warm water at least once per day. This wash down will minimize the harmful effects of chemical disinfectant residues being allowed to accumulate on the equipment.

When using chemical disinfectants, always pay strict attention to the manufacturer's disinfectant directions. When using concentrated disinfectants, measure the concentrate carefully and mix according to package directions. Disinfectant solutions that are relatively harmless to surfaces at their recommended strengths can be corrosive at higher than recommended dilution ratios.

---

**Unacceptable Disinfectants**
These disinfectants will harm the surface finishes of dental equipment and are not recommended. Use of these products will void your warranty.

**Conditionally Acceptable Disinfectants**
These disinfectants have been found to be the least harmful to the equipment surfaces by our test methods.

**Chemical Composition**

*The Manufacturer makes no representation as to the disinfectant efficacy of these products. We make no warranty expressed or implied that these disinfectants will not damage the surface finishes. Damage and discoloration of the surface finishes are not covered under the warranty.

**Iodophor-based disinfectants will cause yellow staining on many surfaces. Regular washing with soap and water will minimize this staining. Iodophor neutralizers such as Promedyne are also available.
Cleaning Dental Chair Upholstery

NOTE: As with all cleaning products, first clean a small inconspicuous area to ensure the material will not discolor or fade.

It is recommended that each stain be cleaned in a step by step manner using the sequence below:

1. **Regular Cleaning**
   A solution of 10% household liquid dish soap with warm water applied with a soft damp cloth. Rinse with clean water and wipe dry. Cleaning frequency depends upon use. It is recommended that upholstery be cleaned between patients.

2. **Stubborn Stains**
   Use detergent cleaners such as Formula 409 or Fantastik. Wipe using a soft cloth or bristle brush. Rinse with clean water and wipe dry.

3. **More Difficult Stains**
   Carefully clean the stained area with lighter fluid (naphtha) or rubbing alcohol. Apply with a soft white cloth and rub gently. Rinse with clean water and wipe dry.

4. **Ultra Leather Upholstery**
   - Clean spots with mild soap and water or an ordinary household cleaner such as Fantastic or 409 cleaners. Wipe off any soap residue with a clean damp cloth.
   - Air dry or dry quickly with a warm setting of a hair dryer.
   - For stubborn stains use a mild solvent.
   - Disinfect ultra leather upholstery with a 5:1 bleach solution.
   - Dry cleanable by conventional methods using commercial dry cleaning solvent.

**Other Tips**

- Always apply cleaners with a soft white cloth. Avoid the use of paper towels.
- When using strong cleaning solutions such as alcohol, it is advisable to first test in an inconspicuous area.
- Never use harsh solvents or cleaners that are intended for industrial use.
- To restore luster, a light coat of spray furniture wax may be used. Apply to chair; allow to set for 30 seconds. Lightly buff dry with a clean, dry cloth.
Chair Control Functions

Swing-out Armrests: The armrests rotate outward and will set in either of two positions (straight out or back). Simply push the toe end of the armrest as shown until it snaps into either setting. Pushing back toward the center of the chair will return it to its original position.

![Swivel brake diagram](image)

**WARNING:** Do not use the armrest for leverage while entering or exiting the chair. Risk of injury could be sustained to the patient.

Swivel Brake: This handle locks and unlocks the chair’s upper structure and allows it to swivel from side-to-side. Turning the handle to the right unlocks the chair’s upper structure. Turning the brake handle to the left locks the chair’s upper structure into position.

Electronic Foot Control: The electronic foot control can control the chair’s manual base and back positioning as well as access the available auto positions. See the *Programming Instructions* section for further information.
Double Articulating Headrest

The articulating headrest can be adjusted by depressing the Quick Release Button and situating the headrest in the desired position. Release the button to lock headrest into place.

**Headrest Tension Adjustment:** Separate the chair back upholstery from the backrest by lifting up on the backrest upholstery to release the cushion from the backrest pins. Locate the tension adjustment set screw and turn screw clockwise to increase tension to the glide bar or counterclockwise to decrease tension. Once tension is set, reattach upholstery and slide glide bar into chairback.

**WARNING:** Do not place anything under the chair base cover while the chair is operating, as injury could result if the safety circuit fails.
Foot Control Operation and Programming

Any position may be achieved by manually moving the base and backrest with the electronic foot control.

"0" & "1" AUTO BUTTONS
(Programmable dismiss / preposition)

MANUAL BACKREST
(Incline/Recline) ADJUSTMENT

MANUAL BASE (Up/down) ADJUSTMENT

Typical suggested positions

POSITION #1:
Exit position

POSITION 2:
Work position
Foot Control Functions (Continued)

This chair is capable of storing two (2) positions:

1. Using the **manual** adjusting buttons, adjust the chair to the desired position (see illustrations on page 9 for suggested positions).

2. Press and hold the **LEARN** button, the chair will beep **once** to confirm. While holding the **LEARN** button, press the desired auto button ("0" or "1") **TWO TIMES**.

3. Upon releasing the **LEARN** button, listen for **two** quick beeps to confirm the position has been set.
   
   **NOTE:** To program the second auto button, repeat procedure.

**TO OPERATE** — Press the pre-programmed auto button **once**.

**WARNING:** When lowering chair, ensure adequate distances between legs and chair to prevent possible injury.
ErgoSoothe™ Massage option

ErgoSoothe™ Massage bladders are located in the backrest cushions. These bladders are air driven and will fluctuate as the massage is in process.

To activate the massage functions, flip the switches to "ON" position and flip the switch to "OFF" position to deactivate the massage.

If only the shoulder area is to be massaged, flip the shoulder switch to "ON" and keep the lumbar switch in the "OFF" position or vice versa.

WARNING:
ErgoSoothe MUST BE SUPPLIED WITH A 1/4" OD, 80 -100 PSI AIR SUPPLY LINE. SET PRESSURE REGULATOR WHILE ErgoSoothe IS IN THE OFF POSITION, BETWEEN 5 -7 PSI. DO NOT EXCEED 7 PSI. DOING SO WILL CAUSE THE RELIEF VALVES AT SWITCHES TO VENT WHILE ErgoSoothe IS RUNNING!

The air pressure coming in to the bladders can be adjusted at the desired comfort level. The pressure control knob and gauge are located in the pump area of the chair.

Remove the pump cover and turn control knob to the desired pressure.

CAUTION: Maximum air pressure is 7 PSI. Do not exceed the maximum.

Once pressure is set, replace pump cover.
MEDICAL ELECTRICAL EQUIPMENT
ELECTROMAGNETIC COMPATIBILITY
(INSTRUCTIONS FOR USE)

ELECTROMAGNETIC COMPATIBILITY
Electrical medical devices are subject to special EMC safety measurements and as a result the equipment must be installed according to the Pelton and Crane installation instruction manual.

PORTABLE ELECTRONIC DEVICES
Portable and mobile high frequency electronic communications equipment may interfere with electronic medical devices.

STATIC SENSITIVE DEVICES
Where labeled this equipment contains static sensitive devices that require special precautions when handling. At a minimum a grounded wrist strap that is connected to ground stud should be worn to reduce the possibility of damage to the unit.

MEDICAL ELECTRICAL EQUIPMENT
ELECTROMAGNETIC COMPATIBILITY
(TECHNICAL DESCRIPTION)

ELECTROMAGNETIC COMPATIBILITY testing has been done for the following accessory options and they are approved for use with the SP15, SP17, SP18, SP20 and SP30 Dental Chairs
OTP Traditional unit, Models #SCT20, SCT15, and RTC15
OTP Euro Unit, Models #SCE20 and SCE15
OTP Traditional unit, Models #SET20 and SET15
OTP Euro Unit, Models #SEE20 and SEE15
Side Delivery Traditional Unit/Cabinet Mount Models #SDCD15 and SDC-D
Side Delivery Traditional Unit/Wall Mount Models #SDWD15 and SDW-D
Cart Delivery Traditional Unit Model CRT15
Rear Cabinet Mount with Worksurface Model #FWS15
Cart-Swing Mount Models #FCT15 and FCT
Rear Cabinet Custom Delivery Model #CD15

ACCESSORY USE
Using accessory devices not specified by Pelton and Crane for use with their equipment may results in an increase of electromagnetic emissions and/or a decrease in electromagnetic immunity of the system.

INTERFERENCE FROM OTHER EQUIPMENT
If other equipment is used adjacent to or stacked with the Pelton and Crane equipment the system must be observed to verify normal operation.
Control Functions

RF emissions

CISPR-11 Group 1

The systems use RFSP15, 17, 18, 20, and 30 energy only for its internal function. Therefore, their emissions are very low and are not likely to cause any interference in nearby electronic equipment.

CISPR-11 Class A

The systems are suitable for use in all establishments, other than 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

Voltage Fluctuations/ Flicker Emissions

IEC 61000-3-3

Guidance and manufacturer’s declaration—electromagnetic emissions

The Models SP15, SP18, SP17, SP20 and SP30 Dental Chairs are intended for use in the electromagnetic environment specified below. The customer or the user of the SP15, SP17, SP18, SP20 or the SP30 should assure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Emissions Test</th>
<th>Compliance</th>
<th>Electromagnetic Environment Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF emissions</td>
<td>Group 1</td>
<td>The SP15, 17, 18, 20, and 30 systems use RF energy only for its internal function. Therefore, their emissions are very low and are not likely to cause any interference in nearby electronic equipment.</td>
</tr>
<tr>
<td>RF emissions</td>
<td>Class A</td>
<td>The SP15, 17, 18, 20 and 30 systems are suitable for use in all establishments, other than domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.</td>
</tr>
<tr>
<td>Harmonic Emissions</td>
<td>Class A</td>
<td></td>
</tr>
<tr>
<td>Voltage Fluctuations/ Flicker Emissions</td>
<td>Complies</td>
<td></td>
</tr>
</tbody>
</table>

Recommended separation distances between portable and mobile RF communications equipment and the SP15, SP17, SP18, SP20 and the SP30

The Models SP15, SP17, SP18, SP20 and SP30 Dental Chairs are intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the SP15, 17, 18, 20 or 30 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the SP15, 18, 17, 20 or 30 as recommended below, according to the maximum output of the communications equipment.

<table>
<thead>
<tr>
<th>Rated maximum output power of transmitter W</th>
<th>Separation distance according to frequency of transmitter m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 kHz to 80 MHz</td>
</tr>
<tr>
<td>0.01</td>
<td>d= 1.2√P</td>
</tr>
<tr>
<td>0.1</td>
<td>0.12</td>
</tr>
<tr>
<td>1</td>
<td>0.38</td>
</tr>
<tr>
<td>10</td>
<td>3.8</td>
</tr>
<tr>
<td>100</td>
<td>12</td>
</tr>
</tbody>
</table>

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (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 to 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.
<table>
<thead>
<tr>
<th>Immunity Test</th>
<th>IEC 60601 Test Level</th>
<th>Compliance Level</th>
<th>ELECTROMAGNETIC ENVIRONMENT GUIDANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELECTROSTATIC DISCHARGE (ESD) IEC 61000-4-2</strong></td>
<td>+/-6 kV contact</td>
<td>+/-6 kV contact</td>
<td>Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material the relative humidity should be at least 30%. Where labeled, a ground strap (connected to ground lug) should be worn to reduce the possibility of damaged to the unit when servicing.</td>
</tr>
<tr>
<td>61000-4-2</td>
<td>+/-8 kV air</td>
<td>+/-8 kV air</td>
<td></td>
</tr>
<tr>
<td><strong>ELECTRICAL FAST TRANSIENT/BURST IEC 61000-4-4</strong></td>
<td>+/-2 kV for power supply lines</td>
<td>+/-2 kV for power supply lines</td>
<td>Mains power quality should be that of typical commercial or hospital environment.</td>
</tr>
<tr>
<td></td>
<td>+/-1 kV for input/output lines</td>
<td>Not applicable, No I/O lines</td>
<td></td>
</tr>
<tr>
<td><strong>SURGE IEC61000-4-5</strong></td>
<td>+/-1 kV differential mode</td>
<td>+/-1 kV differential mode</td>
<td>Mains power quality should be that of typical commercial or hospital environment.</td>
</tr>
<tr>
<td></td>
<td>+/-2 kV common mode</td>
<td>+/-2 kV common mode</td>
<td></td>
</tr>
<tr>
<td><strong>VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS ON POWER SUPPLY INPUT LINES IEC 61000-4-11</strong></td>
<td>&lt;5% U&lt;sub&gt;T&lt;/sub&gt; (&gt;95% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 0.5 cycle</td>
<td>&lt;5% U&lt;sub&gt;T&lt;/sub&gt; (&gt;95% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 0.5 cycle</td>
<td>Mains power quality should be that of typical commercial or hospital environment. If the user of the SP15, 17, 18, 20 or 30 requires continued operation during power mains interruptions, it is recommended that the SP15, 17, 18, 20 or 30 be powered by an uninterrupted power supply or battery.</td>
</tr>
<tr>
<td></td>
<td>40% U&lt;sub&gt;T&lt;/sub&gt; (60% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 5 cycles</td>
<td>40% U&lt;sub&gt;T&lt;/sub&gt; (60% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 5 cycles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70% U&lt;sub&gt;T&lt;/sub&gt; (30% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 25 cycles</td>
<td>70% U&lt;sub&gt;T&lt;/sub&gt; (30% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 25 cycles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;5% U&lt;sub&gt;T&lt;/sub&gt; (&gt;95% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 5 seconds</td>
<td>&lt;5% U&lt;sub&gt;T&lt;/sub&gt; (&gt;95% dip in U&lt;sub&gt;T&lt;/sub&gt;) for 5 seconds</td>
<td></td>
</tr>
<tr>
<td><strong>POWER FREQUENCY (50/60 HZ) MAGNETIC FIELD IEC61000-4-8</strong></td>
<td>3 A/m</td>
<td>3 A/m</td>
<td>Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.</td>
</tr>
</tbody>
</table>

U<sub>T</sub> is the AC mains voltage prior to application of the test level.
The Models SP15, SP18, SP17, SP20 and SP30 Dental Chairs are intended for use in the electromagnetic environment specified below. The customer or the user of the SP15, SP17, SP18, SP20 or the SP30 should assure that it is used in such an environment.

### ELECTROMAGNETIC ENVIRONMENT GUIDANCE

Portable and mobile RF communications equipment should be used no closer to any part of the SP15, 17, 18, 20 or 30, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.

#### Conducted RF

<table>
<thead>
<tr>
<th>Test</th>
<th>IEC 60601 Test Level</th>
<th>Compliance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 kHz to 80 MHz</td>
<td>3 Vrms</td>
<td>3 Vrms</td>
</tr>
</tbody>
</table>

Recommended separation distance:

\[ d = 1.2\sqrt{P} \]

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 meters (m).

Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range.

Interference may occur in the vicinity of equipment marked with the following symbol:

![Interference symbol]

### Immunity Test

<table>
<thead>
<tr>
<th>Immunity Test</th>
<th>IEC Test Level</th>
<th>Compliance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiated RF</td>
<td>IEC 61000-4-3</td>
<td>3 V/m</td>
</tr>
<tr>
<td>80 MHz to 2.5 GHz</td>
<td>3 V/m</td>
<td>3 V/m</td>
</tr>
<tr>
<td>80 MHz 800 MHz</td>
<td>( d = 1.2\sqrt{P} )</td>
<td>800 MHz 2.5 GHz</td>
</tr>
<tr>
<td>800 MHz 2.5 GHz</td>
<td>( d = 2.3\sqrt{P} )</td>
<td></td>
</tr>
</tbody>
</table>

NOTE 1: At 80 MHz to 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 Models SP15, 17, 18, 20 or 30 is used exceeds the applicable RF compliance level above, the SP15, 17, 18, 20 or 30 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the SP 15, 17, 18, 20 or 30.

b) Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3/Vm.