TABLE OF CONTENTS

SYSTEM OVERVIEW ........................................................................................................................................................ 3
GENERAL INFORMATION .................................................................................................................................................... 4
GENERAL SAFETY INSTRUCTIONS SUMMARY .......................................................................................................... 5
TECHNICAL DESCRIPTION ............................................................................................................................................... 6
1500 CART INSTALLATION ............................................................................................................................................... 7
1500 CART INSTALLATION ............................................................................................................................................... 8
INSTALLATION .................................................................................................................................................................. 9
OPTIONAL EQUIPMENT INSTALLATION ........................................................................................................................ 10
FINAL ADJUSTMENTS ...................................................................................................................................................... 11
ELECTRICAL DIAGRAM ................................................................................................................................................... 12
PLUMBING SCHEMATIC .................................................................................................................................................. 13
DELIVERY SYSTEM INSTALLATION AND SERVICE CHECKLIST ...................................................................................... 14

CAUTION: Federal law restricts this device to sale by or on the order of a dentist.

Technical Support

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

Phone: 800-659-5922
Fax: 800-659-7255
Catalog 1540 and 1550 carts feature the Asepsis Automatic Control for three handpieces mounted on a mobile cart. In addition to the three handpiece control, the Catalog 1540 also comes with Assistant's Instrumentation.

All of the controls used in normal operation are located on the underside of the cart head, where they are sheltered from aerosol contaminants.

The adjustable height cart head is mounted on a stable U-frame. The top of the cart is hinged to permit easy access to the internal components.
GENERAL INFORMATION

Definition of Symbols

The following symbols and terms may be used throughout this manual and your equipment:

[WARNING: Failure to carefully follow the described procedure may result in damage to the equipment and/or injury to the patient/operator.]

Risk of electrical shock present. Make sure power is disconnected before attempting this procedure.

See operating instructions.

(AC) Alternating current.

Protective earth (Ground)

Manufacturing Date

Manufacturing Place

Waste Electrical and Electronic Equipment.

Type B Applied part.


Conforms with the Essential Requirements of the European Medical Device Directive 93/42/EEC for Class IIa Devices.

Indicates conformity to General Requirements for Safety is certified by Intertek Testing Services.

General mandatory action required, important to follow instruction. Not a caution.

Warning, strong magnetic field.

Off

On

Light Switch

European Authorized Representative

USB Port

Authorized Representative:
Kaltenbach & Voigt GmbH
Bismarckring 39
88400 Biberach
Germany

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

Incompatible Units or Accessories: To guarantee the operational safety and function of this device, the use of unapproved units or accessories is not advised. Doing so could result in potential hazard. Using accessory equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Connecting electrical equipment to multiple socket outlets effectively leads to creating an ME SYSTEM, and can result in a reduced level of safety. All configurations shall comply with the system standard IEC 60601-1-1 or IEC 60601-1:2005

Product Identification

This product can be identified by its product label. This label states the unit model and serial number, electrical specifications, manufacture date and safety classification. Note the SAMPLE label shown below.

Working Environment

The unit is to be used in an office environment only.

Recommended working condition is:

Ambient Temperature: 68°F to 76°F (20°C to 25°C)
Relative Humidity: 20% to 60% non-condensing
Atmospheric Pressure: 13.1 to 15.3 PSI (900 to 1060hPa)

WARNING: It is not safe to use the unit where there is flammable gas or other hazardous material. Such materials can easily catch fire resulting loss of lives and heavy property damages

Storage Conditions: The device is appropriately packaged in a box. If product is to be stored before installation, storage and handling instructions in the packaging should be adhered to. Handling and storage conditions are marked on the box.

Temperature: -4°F to 122°F/-20°C to 50°C, Non-condensing
Relative Humidity: 10% to 90%

If the device is not to be used for some time, ensure the water line is disinfected and flushed with air before the master switch is switched off.
SAFETY INSTRUCTIONS SUMMARY

Please read the safety warnings and instructions before using the device. The manufacturer’s liability is applicable only if the device is used in compliance with the directions and safety warnings provided in this manual. Safety warnings are spread throughout the manual.

WARNING: This product is intended for use by trained dental professionals only.

WARNING: A dental unit may include magnets in the construction of the device which may temporarily affect the function/programming of some implantable pacemakers or defibrillators. If the implanted device is programmed to respond to a magnet, people who have these type of devices should avoid dental units with magnets.

WARNING: To avoid risk of electric shock, this equipment must be connected only to supply mains with protective earth. Do not position unit in such a way that it is difficult to unplug.

Ensure that the J-box, delivery head and PMU covers are in place before operating the dental system. Failure to follow instructions may cause electric shock or other injuries.

WARNING: Power cords and their associated parts cannot be substituted without increased risk of electric shock or fire. We recommend the use of authorized replacement parts only! Power cords must be installed by qualified personnel. Make sure all service loops, strain reliefs, and cord guards are in place and that line, neutral and ground wires are secured.

WARNING: No unauthorized modification of this equipment is allowed. Failure to comply with will void the warranty.

Refer to the Installation Instructions, Use & Care manual and accessory manufacturer’s literature to install and operate safely.

WARNING: Federal law restricts this device to sale by or on the order of a dentist.

WARNING: This product must be disinfected before use. Failure to disinfec may promote contamination.

WARNING: Dental instruments and accessories are sharp - use care when near the dental unit. Remove sharp tips when not in use to prevent injury.

WARNING: Failure to return handpieces to proper location could result in alternate or additional handpieces operating without notice.

WARNING: Proper personal protective equipment (PPE), including, but not limited to, gloves and eye protection, must be used when operating the dental unit. Failure to use protective equipment can expose operator and patient to cross-contamination.

WARNING: Failure to install the syringe tip correctly can result in injury or damage. Refer to the documentation that came with the syringe for full instructions on proper installation and use.

WARNING: Only authorized service technicians should install and service this equipment. Use of other than authorized technicians will void the warranty.

WARNING: Use a licensed electrician for all wiring.

WARNING: Failure to disinfect equipment between patients could expose user/patient to cross contamination and bio-burden/bio-contamination.

Use only Pelton and Crane replacement parts. All repairs should be performed by authorized Pelton & Crane Dealer/ or their representatives.

As manufacturers of electro-medical products we can assume responsibility for safety-related performance of the equipment only if maintenance, repair and modifications are carried out only by Pelton & Crane or agencies we have authorized for this purpose, and if components affecting safe operation of the unit that may be needed are replaced with original parts.

We suggest that you request a certificate showing the nature and extent of the work performed, from those who carry out such work, and specify that the certificate show any changes in rated parameters or working ranges, as well as the date, the name of the firm and a signature.
**TECHNICAL DESCRIPTION**

**Intended Use - Dental Unit**

**Indications for Use:**
The Spirit Dental Operative Units are intended to supply power to and serve as a base for other dental devices and accessories by providing air, water, vacuum and low voltage electrical power to hand held dental instruments. The Spirit Dental Operative Units are intended for use by professional dental practitioners in providing treatment to dental patients in a dental operatory.

**Product Description:**
The Spirit Dental Operative Units serves as a base that includes components to deliver air, water, electrical power, and vacuum to dental handpieces, instruments, and accessories. The controls are contained in a Doctor’s Unit, an Assistant’s Unit, and a Cuspidor. Additional parts include mount arms, foot control, and a junction box that houses a power supply and air/water regulators. Various Handpieces and accessories can be added to the Spirit Dental Operative Unit which Pelton & Crane does not manufacture but does provide a means to connect them into the Spirit Dental Operative Units. These include, but not limited to, pneumatic handpieces, electric motors with handpieces, scalers, intra-oral cameras, curing lights, air/water syringes, SE and HVE vacuum instruments.

The dental delivery system is classified as Class1 device under rule FDA CFR 21, Class II device under Health Canada guidelines and a Class IIa device under rule 11 of the MDD 93/42/EEC of Annex IX.

**Air and Water Supply Requirements**

| Air Quality: | Dry, clean and oil free |
| Pressure: | 80-100 psi (5.5 - 7.0 bar) |

| Water Quality: | Water must meet EPA requirements for municipal water. |
| Hardness: | 6.5 - 8.5 pH |
| We recommend water treatment for very hard water to minimize mineral deposits in the water line fittings and valves. We do not recommend the use of distilled water as it is known to corrode components. |
| Pressure: | 40-80 psi (2.75-5.5 bar) |

**Electrical Specifications**

<table>
<thead>
<tr>
<th>Volts</th>
<th>Cycles</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>115 VAC</td>
<td>60 HZ</td>
<td>3 A ~</td>
</tr>
<tr>
<td>230 VAC50/60 HZ</td>
<td>1.5 A ~</td>
<td></td>
</tr>
</tbody>
</table>

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

**IEC Medical Device Classification**

| Classification: | I |
| Type: | B |
| Operation Mode: | Continuous |
| Splash Protection: | IPX0 |

**Handpiece Compatibility**

This delivery system is designed to be compatible with air driven handpieces that conform to ISO 13294 and electric handpieces that conform to ISO 11498.

For the air driven handpieces, tubing is available in 4-hole Midwest style tubing. For electric handpieces, dental units will be equipped with an "E-type" coupler and cordset.

The end user will have specified the preferred type prior to ordering from the factory. It is the responsibility of the end user to procure appropriate handpieces for use with this delivery system. Certain countries may have particular regulations regarding which handpieces are acceptable for use; e.g. countries in the European Union require handpieces which meet the requirements of the Council Directive 93/42/EEC. See your local dealer for additional information.

The manufacturer will supply, upon request, circuit diagrams, component parts list, descriptions and other information needed to assist service technicians in repairing or servicing the dental unit.

Refer to handpiece manufacturer’s manual for safe and functional operations of the accessory.

**Incompatible Units or Accessories:**

To guarantee the operational safety and function of the device, the use of unapproved units or accessories is not advised. Doing so could result in potential hazard. Using accessory equipment, not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Connecting electrical equipment to a multiple socket outlet effectively leads to creating a ME system and can result in a reduced level of safety. All configurations shall comply with the system standard IEC60601-1-1 or IEC60601-1-1:2005.
1500 CART INSTALLATION

Junction Box Installation

1. Prior to junction box installation it will be necessary to flush out the office plumbing. Connect a hose to the water line and flush into a drain or a suitable container. This will prevent debris getting into unit lines. Flush the air line also.

2. Locate the junction box template for general layout. Place the junction box frame over the office plumbing with the umbilical entering the enclosure on the properly configured side.

   Note: If unit is equipped with a power supply box, see template for proper orientation inside the junction box.

   Next, install the master shut-off valves. Using a 5/8" wrench, install the air and water shut-off blocks onto the master valves. Tighten the compression nuts securely.

   Note: It is recommended that the junction box power supply installed after the junction box installation to improve access to plumbing connections.

3. If it is necessary to shorten the umbilical, shorten only the outer, as required. Remove the umbilical retainer and carefully shorten the tubings. Reinstall the umbilical retainer when done.

4. Locate the control head 10-bundle tubing coming from the unit umbilical (it will be enclosed in a braided sheath). Connect the tubing to the corresponding bundle of tubing coming from the air and water shut-off blocks. Match tubing by color and screw in connectors until tight. If a foot control will be connected at this location, make the additional connections.

5. On all units, connect the vacuum tubing to the office vacuum fitting. Make sure an air tight connection exists by using the included locking clamp.

6. Install the umbilical into the junction box frame remaining notch.

7. Mount the junction box frame to the floor using correct screws for mounting surface.

8. After completing final adjustments, reinstall the junction box power supply and mount it to the junction box base using four #10 screws.

Fuse details of the 300w transformer are shown in the table below:

<table>
<thead>
<tr>
<th>Fuse Identity</th>
<th>Voltage(VAC)</th>
<th>Amps</th>
<th>Speed</th>
<th>Braking Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>250</td>
<td>4</td>
<td>Fast Acting</td>
<td>35 A@250V</td>
</tr>
<tr>
<td>F2</td>
<td>250</td>
<td>4</td>
<td>Fast Acting</td>
<td>35 A@250V</td>
</tr>
<tr>
<td>F3</td>
<td>250</td>
<td>4</td>
<td>Fast Acting</td>
<td>35 A@250V</td>
</tr>
<tr>
<td>F4</td>
<td>250</td>
<td>4</td>
<td>Time-lag</td>
<td>35 A@250V</td>
</tr>
<tr>
<td>F5</td>
<td>250</td>
<td>3.2</td>
<td>Time-delay</td>
<td>35 A@250V</td>
</tr>
<tr>
<td>F6</td>
<td>250</td>
<td>3.2</td>
<td>Time-delay</td>
<td>35 A@250V</td>
</tr>
<tr>
<td>F5*</td>
<td>250</td>
<td>1.6</td>
<td>Time-delay</td>
<td>35 A@250V</td>
</tr>
<tr>
<td>F6*</td>
<td>250</td>
<td>1.6</td>
<td>Time-delay</td>
<td>35 A@250V</td>
</tr>
</tbody>
</table>

Power from the dental unit is disconnected by unplugging transformer cord from receptacle.

F5* and F6* are for 230 VAC Units

FOOT CONTROL INSTALLATION

1. Remove foot control from package.

2. Install foot control into the junction box frame.
Install the four wheels into the U-frame of the cart structure. Wheel studs are inserted into the frame bottom and pushed in to install. No tools are needed for assembly.

**Adjusting the Cart Height**

The vertical support post on the cart frame has a telescoping section that allows the cart top to be adjusted to any height between 32 and 42 inches. Your setting is secured by a large knob.

**WARNING:** When making the cart height adjustment, support the weight of the cart head before loosening the knob. If the head is not supported, the cart will drop freely to the bottom of its range, possibly causing damage to the unit and/or personal bodily injury.

To adjust the work surface height, loosen the knob while supporting the weight of the cart head. Raise or lower the work surface to the desired height, then tighten the knob securely.

**Repositioning the Handpiece Holders**

The handpiece holders are attached to the holder bar by two socket head setscrews. To reposition a holder, use a 1/8-inch hex key to loosen the setscrews, move the holder to the desired position and re-tighten the setscrews.
**WARNING:** Before making any connections, be sure all power has been disconnected. Making connections while chair or unit is connected to power source may result in equipment damage or injury.

**Air/Water Connection**
OPTIONAL EQUIPMENT INSTALLATION

Before connecting optional equipment, be certain all power is disconnected to the chair.

Optional KaVo ELECTROmatic

1. Place the supplied power supply in the junction box.
2. Connect the 33VDC connector to the corresponding connector from the 8 conductor cable.
3. Plug the supply cord into the dealer supplied receptacle.

Optional Scaler

1. It may be necessary to make power connections for the scaler to the supplied 300 watt power supply PCB. Depending on the shipping methods, these connections may not have been made in the factory.
2. Connect the blue and orange supply lines from the 8-conductor cable to the terminal strip at the flaps designated “scaler” feed and return (24 VAC taps).

Optional Curing Light

1. It may be necessary to make power connections for the curing light to the supplied 300 watt power supply PCB. Depending on the shipping methods, these connections may not have been made in the factory.
2. Connect the green and yellow supply line from the 8-conductor cable to the terminal strip at the tap’s designated “auxiliary” feed and return (24 VAC taps).

Optional Light Source

1. It may be necessary to make power connections for the optional light source to the supplied 300 watt power supply PCB. Depending on the shipping methods, these connections may not have been made in the factory.
2. Connect the brown and white supply lines from the 8-conductor cable to the terminal strip at the tap’s designated “fiber optic” feed and return (9 VAC taps).

WARNING: Placing the handpieces in the wrong holder may cause the user and/or patient to be cut or injured.
FINAL ADJUSTMENTS

Spirit Control Head / Junction Box

1. Check to see that the master on/off toggle is in the "off" position. Turn on the manual air and water valves located in the junction box. Make a visual and audible inspection for leaks.

2. Turn the master on/off toggle to the "on" position and make a careful inspection for leaks in the following areas:
   A. Junction box
   B. Utility center (if applicable)
   C. Control head; tubing and quick-connects
   D. Any other intermediate connections.

3. Check air and water pressure on junction box gauges. The gauges must read:
   A. Air 75 - 80 PSI
   B. Water 35 - 40 PSI.

   Turn air regulator knob clockwise to increase pressure and counterclockwise to decrease. For an accurate reading from the gauge, bleed off the air pressure by using the air syringe button. Adjust air pressure regulator knob in half turn steps.

4. Check the flow of air and water from the syringe and check the spray pattern. Hold the handpiece tubings over a suitable receptacle and activate the flush toggle on the control head. A steady stream of water should flow from the tubings.

5. Ensure that the handpieces to be installed have the proper connectors for the supplied tubings.

6. Install the connectors onto the handpieces and place each handpiece in its appropriate holder.

7. Locate the drive air adjusting stems on the control head to adjust handpiece air. Install handpiece onto connector and activate foot control while observing reading on drive air pressure gauge. Adjust handpiece pressure to manufacturer's requirements using drive air adjustment stems.

8. Check the water spray pattern of each handpiece. Clockwise rotation of the water control valve increases water flow.

9. Counterclockwise rotation of the coolant water control valve decreases the water flow.

10. This completes testing of the control head. Install the tray and pad onto the assembled swivel tray (if applicable).

**WARNING:** Avoid running handpieces for extended periods longer than necessary to check pressure. Extended running with no load can damage the handpiece. No handpiece should ever be run without a burr in the chuck. After operating handpieces, ensure that they are returned to their original hangers.

**WARNING:** When installing and using instruments and attachments, refer to all manufacturer’s instructions and recommendations before operating instruments.

**WARNING:** Do not activate syringe while tip is in direct contact with skin.

**WARNING:** This product must be disinfected before use.
All manuals are present.

All Labels are present and legible.

No mechanical damage on new installations.

The unit is connected to the correct power source.

The unit is setting on a level surface.

All air/water connections are properly attached.

When the master switch is “on” all air and water is available. When the master switch is “off” and the system pressure is bled down, the air and water stop flowing.

If applicable, the cover is closed and fasteners tightened (take care not to pinch tubing on wires).

When depressing the touchpad (if applicable), the unit/chair functions properly.

While running the unit there is no water or air leaking from the tubing.

The unit passes a high pot test.

All terminals are connected securely.

The unit passes a ground continuity test.

The internal wiring is in good shape and not frayed.