Spirit RM Chair
Mounted Assistant’s
Installation Instructions

Model: RM
Catalog: RM30 RM30S
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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
Customer Service: 800-659-6560
SYSTEM OVERVIEW

Catalog:
RM30
RM30S
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

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
- 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.
GENERAL SAFETY 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 types of devices should avoid dental units with magnets.

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: To avoid risk of electric shock, this equipment must be connected only to supply mains with protective earth.

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: No unauthorized modification of this equipment is allowed.

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

CAUTION: 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 disinfect may promote contamination.

WARNING: Dental instruments and accessories are sharp - use care when near the dental unit.

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 attempt to 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 Dealers or their representatives.

The dental unit complies with IEC/EN 60601-1 third edition.

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.

062939 R04
**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 serve 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.

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**Air and Water Supply Requirements**

<table>
<thead>
<tr>
<th>Air Quality: Dry and clean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure: 80-100 psi (5.3 - 6.7 bar)</td>
</tr>
<tr>
<td>Water Quality: Potable</td>
</tr>
<tr>
<td>Hardness: 7.2 - 7.8 pH</td>
</tr>
<tr>
<td>Pressure: 40-80 psi (2.75-5.5 bar)</td>
</tr>
</tbody>
</table>

**Electrical Specifications**

<table>
<thead>
<tr>
<th>Volts</th>
<th>Cycles</th>
<th>Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>115 VAC 60 HZ</td>
<td></td>
<td>3 A ~</td>
</tr>
<tr>
<td>230 VAC 50-60 HZ</td>
<td></td>
<td>1.5 A ~</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**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Type</th>
<th>Operation Mode</th>
<th>Splash Protection</th>
<th>USB Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>Continuous</td>
<td>IPX0</td>
<td>5VDC at 500mA</td>
</tr>
</tbody>
</table>

**Fuse Identity**

<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>35A @ 250V</td>
</tr>
<tr>
<td>F2</td>
<td>250</td>
<td>4</td>
<td>Fast Acting</td>
<td>35A @ 250V</td>
</tr>
<tr>
<td>F3</td>
<td>250</td>
<td>4</td>
<td>Fast Acting</td>
<td>35A @ 250V</td>
</tr>
<tr>
<td>F4</td>
<td>250</td>
<td>10</td>
<td>Time-lag</td>
<td>35A @ 250V</td>
</tr>
<tr>
<td>F5</td>
<td>250</td>
<td>3.15</td>
<td>Time-delay</td>
<td>35A @ 250V</td>
</tr>
<tr>
<td>F6</td>
<td>250</td>
<td>3.15</td>
<td>Time-delay</td>
<td>35A @ 250V</td>
</tr>
<tr>
<td>F5*</td>
<td>250</td>
<td>1.6</td>
<td>Time-delay</td>
<td>35A @ 250V</td>
</tr>
<tr>
<td>F6*</td>
<td>250</td>
<td>1.6</td>
<td>Time-delay</td>
<td>35A @ 250V</td>
</tr>
</tbody>
</table>

F5* & F6* are for 230VAC units.

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The dental delivery system is classified as Class 1 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.

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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.

See separate manual for optional electrotorque TLC motor.
1. Remove the chair’s safety cover and truss end cover (Figure A). Locate and unpack the unit and post mount. Position the post mount to the chair bracket located on the backside of the chair. Secure the unit to the chair using the two 1/4-20 x 3/4” flat hex head screws and the one 5/16-18 shoulder screw (Figure C). Lightly tighten these screws.

2. Check the level of the unit. Level, if needed, by attaching a magnetic level to each side of the unit arm as shown in figure A, and by using the set screws at the bottom plate of the mount, shown in Figure C. To adjust the pitch from side to side, use the set screw located on the upper left side of the mount. To adjust the pitch from front to back, use the two set screws located on the lower right and left side of the mount. Loosen the 1/4-20 flat head screw or the 5/16-18 shoulder screw as needed. Then, adjust the set screws to move the mount in the desired direction (Figure B). Route the umbilical through the chair, continuing through the pump cover and to the inside of the junction box. Make all tubing connections in the junction box. Make all tubing connections in the junction box.

3. Adjust the tension to the pivots by turning clockwise to tighten tension, and counterclockwise to loosen tension. To adjust the pivot closest to the chair, remove the bearing cover and adjust the 5/8-11 nut as needed to attain the desired amount of tension. Replace the bearing cover. To adjust the outer pivot, adjust the 5/8-11 nut closest to the mount, as needed, to attain the desired amount of tension (Figure C).

4. Replace the chair’s truss end cover and safety cover with the new truss end and safety covers (Figure A).
1. Locate and install the HVE and SE at this time. Connect the quick connect to the port on the vacuum canister.

2. Cap off any unused ports with the supplied cap. Hang the instruments on the correct holders.

USB Port

1. The USB cable is a continuous cable from the unit head to the chair base (as shown on pages 7 & 8). The use of accessory equipment not complying with the safety standards of this equipment may lead to a reduced level of safety.
RECOMMENDED JUNCTION BOX LAYOUT

3000 J-Box

- Sopro Camera Docking Station/
  Curing Light Module
  (See connection diagram pages
  13 & 12)
- Ground Wire
  (green/yellow)
- Monitor
  Power Supply
  (If equipped)
- USB Cable
- KaVo
  E-motor
  (If equipped)

1800 J-Box

- SOPRO camera
  Docking Station/
  Curing Light
  Module
- Utilities
  Access
- Transformer Pigtail

- Transformer Enclosure
JUNCTION BOX INSTALLATION

The following information is written specifically for installation of the Spirit chair-mounted RM30 Series Assistant’s Unit.

**NOTE:** 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 pail. This will prevent debris getting into unit lines. Flush the air line also.

1. Locate the junction box template and refer to figure E for general layout. Place the junction box base over the office plumbing with the umbilical opening facing the chair. Using a 5/8” wrench, install the air and water shut-off blocks onto the master valves. Tighten the compression nuts securely.

2. Run air/water, vacuum and cabling from the rear mount through the chair.

3. Install the vacuum tubing to the office plumbing. Make sure an air tight connection exists by using the included hose clamp. On the RM30S connect the vacuum relay wires to the appropriate terminals.

4. Connect air and water tubing from the rear mount to corresponding tubing coming from the air/water shut-off blocks. Match tubing by color and number.

   If equipped with an integrated camera or curing light, follow the installation procedures shown on pages 10-12 before proceeding.

Plug any unused tubings.
5. The air regulator is set at 80 psi and the water regulator at 40 psi by factory. Check to ensure regulators are correctly set by switching the master on-off switch. Adjustment may be done at this stage as needed. Regulator knobs are turned clockwise to increase pressure and counter-clockwise to decrease pressure.

6. Check air and water flow at the syringe as the master on-off switch is turned on. Also check to ensure the air and water are cut off when the master on-off switch is turned off. The master on-off switch may be located under the assistant’s head when there is no delivery unit.

7. Make repairs if there are any air or water leaks. Ensure all quick connects are tight.

8. Check the vacuum line for leaks.

9. Touchpad: Connect the assistant’s touchpad cable to either of the two connectors in the back of the chair as shown in figure H. If both connectors are already in use, it will be necessary to plug in the touchpad directly into an unused connector on either the chair board or power board. (Use the provided touchpad extension cable.) See figures at right. The chair is controlled by this touchpad.

10. Rear mount installation is complete.
Before connecting optional equipment be certain all power is disconnected to the chair.

**Optional Acteon Sopro 717 Camera (See page 12)**

1. **Power Connector:** Connect stripped wire ends of 062979 to the appropriate terminal on the docking station.
   - If installing a 3000 Chair, connect the stripped wire ends of P/N 062983 directly to the Transformer Power board, as shown in figure 2, then connect 062979 to 062983 together (Green/White is Camera Power). See figure 1.
   - In 1800 Chairs, connect 062979 directly to the appropriate connection in the Transformer Pigtail (062983 is not used)
   - If not equipped with a transformer use the supplied wall transformer(s). (115V models only)

2. Ensure the colored ends of the Camera Main Cable (P/N 057244, found in the Docking Station assembly, P/N 057239) are connected to the corresponding terminals on the Docking Station. See figure 1.

3. Connect the White tubing from the umbilical to the A/E switch as shown in figure 1.

4. Install the Docking Station in Housing (P/N 062966) with terminals toward the inside as shown in figure 3. Install the Housing Gate (P/N 062967), ensuring the cables are routed through the provided cutouts, and place in the J-box. If accompanied by a Curing Light, both modules are installed in the housing, and the Housing Gate (062967) is not used.

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**Optional Curing Light (See page 13)**

1. **Power Connection:** Connect 051273 to the appropriate terminals on the module.
   - When installing in 3000 chairs, connect the red and black stripped wire ends of 062983 directly to the appropriate terminals on the power board as shown in figure 5. Route 062983 to the J-box and connect to 051273.
   - When installing in 1800 chairs, 051273 is connected directly to the Transformer Pigtail. (062983 is not used)
   - If not equipped with a transformer use the supplied wall transformer(s).

2. Connect the Transparent Yellow tubing from the umbilical to the A/E switch as shown in figure 4.

3. Ensure the curing light cable from the umbilical is connected to the appropriate terminals on the Module (if not already connected).

4. The Curing Light Module is installed in the housing (062966) with the terminals facing inward.

   Install the Gate (062967) as shown, ensuring that cabling is routed through the provided cutouts.

   When accompanied by an Integrated Camera, both modules will be installed in the housing (062966) and the Gate is not used.
OPTIONAL EQUIPMENT INSTALLATION, INTEGRATED CAMERA

To 300W Power Supply (1800 Chair)

Connect to 300W Supply (3000 Chair)

See Connection Chart

Camera Main Cable

Air Line Connection (White)

Air Line Connection (Orange) Optional Camera Foot Control

S-Video

RCA

USB

S-Video

RCA

USB

Figure 1

300 Watt Power Supply PCB located under 3000 Chair Pump Cover

Connect Green/White wires from Camera/Curing Light Power Cord here

DOCKING STATION TERMINAL #  COLOR
3  RED
4  BLUE
5  WHITE
6  BLACK
7  GREEN
8  YELLOW

Docking Station

Gate

Housing

6-32 X 1/4" Screw

Eight Conductor Cable from head

Figure 2

Figure 3
OPTIONAL EQUIPMENT INSTALLATION, CURING LIGHT

300 Watt Power Supply PCB located under 3000 Chair Pump Cover

Mount Curing Light Module as shown.

NOTE: When a Camera is also installed, remove the green/yellow "Curing Light" wires (in 8 conductor cable) from Terminals and connect the red/black wires (from camera/curing light power cord) in their place.
Electrical Diagram
DELIVERY SYSTEM INSTALLATION AND SERVICE CHECKLIST

☐ All manuals are present.
☐ All labels are present and legible.
☐ No mechanical damage on new installations.
☐ The unit is setting on a level surface.
☐ All air/water connections are properly attached.
☐ All air/water connections are properly adjusted.
☐ If applicable, when master switch is “on”, all air and water are available. When master switch is “off” and the system pressure is bled down, the air and water stop flowing.
☐ The cover is closed and fasteners, if applicable, are tightened (take care not to pinch tubing).
☐ 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.
☐ All terminals are connected securely.