

52-15 Pelton & Crane Spirit S1 Dental Unit (Project 97-04) (9/97)

The Pelton & Crane Spirit S1 chair-mounted dental unit is an integral part of the S1 Dental Delivery System. The unit and chair are only sold as a system, and cannot be purchased separately. The unit comes standard with three fiberoptic handpiece connections, a three-way syringe with sterilizable tip, assistant's instrumentation, instrument tray area with non-skid pad, membrane touch-pad control panel, and unique "foot mouse" rheostat. The control panel and/or "foot mouse" rheostat regulate all functions of the unit and dental chair as well as a Light Fantastic II Operator Light. The Spirit S1 provides an Integrated Water System for continuous disinfection of the dental unit waterlines. The system utilizes a 1.4 percent hydrogen peroxide solution (Dentosept P) diluted by an automatic metering device 1:100 with city tap water. According to the manufacturer, in addition to the continuous disinfection, a separate Automatic Sanitization System, standard with the Spirit S1, should be used periodically to maintain waterline disinfection. The unit is equipped with quick-disconnect handpiece hoses, that when connected, integrate with the unit "smart" controller. The controller identifies the handpiece during the power on self-test and applies the selected memorized settings for such functions as fiberoptic intensity, drive air, and water coolant for up to two operators. The S1 evaluated by DIS included the following options: the Sprayvit three-way syringe with fiberoptics and heat, piezoelectric scaler, electric handpiece, Demetron curing light, x-ray viewer, and an amalgam separator. The Pelton & Crane Spirit S1 unit is classified to Underwriter Laboratories (UL) requirements UL 2601-1 for medical equipment; with International Electrotechnical Commission (IEC) 601-1:1988 compliance as part of an international agreement for foreign technology that meets or exceeds International Organization for Standardization (ISO) 9000 standards. The unit/chair configuration can be configured for 115 or 220 volts but must be hard-wired to comply with National Fire Prevention Association (NFPA) 99-1.



Manufacturer:

Pelton & Crane (Siemens)
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Charlotte, NC 28241-7800
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(704) 523-3212
(704) 523-0002 FAX

Government Source:

VA Contract: V797P-3307K
Contract Dates: 21 April 1995 to 21 April 1999

Suggested Retail Price: \$15,545.00 Basic unit/chair without light or options.

Options

\$ 1,925.00 Light Fantastic II
\$ 930.00 Sprayvit (3-way syringe)
\$ 1,000.00 Amalgam Separator
\$ 1,430.00 Curing Light
\$ 210.00 X-ray Viewer

Government Price: \$9,327.00 Same as above.

Options

\$ 1,155.00 Light Fantastic II
\$ 558.00 Sprayvit (3-way syringe)
\$ 600.00 Amalgam Separator
\$ 858.00 Curing Light
\$ 126.00 X-ray Viewer

ADVANTAGES:

- + "Smart controller" stores unit parameter settings for two practitioners.
- + Continuous waterline disinfection system.
- + Membrane touch-pad for unit controls improves infection control.
- + "Foot Mouse" rheostat allows control of unit without contamination by operator.
- + "Air-gap" device prevents backflow of unit water to municipal water supply.
- + Amalgam separator with disposable collection cartridge.
- + Sprayvit three-way syringe with heater and fiberoptics.
- + User-adjustable fiberoptics.
- + DB9 connector port for factory diagnostics and monitoring.
- + Unique keyed twist-lock quick-disconnect hoses.
- + Handpiece oil exhausted into container, not into unit control head.
- + Handpiece lockout valve allows for selection of one or all handpieces to be flushed.
- + One-piece, snap-off hanger covers for handpieces and evacuation hoses aid cleaning.

DISADVANTAGES:

- Steep learning curve required to adapt to and use the unit touch-pad and "foot mouse".
- "Foot mouse" larger than normal rheostat.
- No limitation stops for assistant's instrumentation arm.
- Unit must be disinfected for 24 hours after prolonged periods of disuse.
- Disinfecting bottle connector easily broken.
- Repairs require extra time and special training.
- Control head, assistant instrumentation, cuspidor, and operatory light do not raise and lower with chair resulting in possible accidental damage to unit.
- Must be bolted to floor to prevent tipping.
- Must be hard wired to comply with NFPA 99.
- Dentosept P (H₂O₂ solution) is expensive at \$22.47 per liter.
- Clinical evaluators felt amalgam separator affected vacuum performance.
- Unit not sold separately.

SUMMARY AND CONCLUSIONS:

The Pelton & Crane Spirit S1 unit performed as designed and met the majority of the requirements of the DIS Dental Treatment Unit Checklist, ADA specification No. 47 for dental units, and the 1994 Medical Procurement Item Description (MPID) #1, 6520 Unit, updated Dec 1996). Although the Pelton & Crane Spirit S1 lists only IEC 601-1-1988 compliance, it is UL (Underwriters laboratory) listed under the IEC 2001 trade agreement with foreign manufacturers. The Spirit S1 combines cutting-edge technology with European styling in an advanced dental unit. Asepsis and infection control are addressed by placing all unit controls on one easily disinfected membrane touch-pad and/or the innovative "foot mouse" rheostat. An amalgam separator is available as is an "air-gap" device to prevent possible backflow of unit water into the municipal water supply. Dental unit waterline bacterial colonization is addressed with a continuous water disinfection system. However, the efficacy of the system was not evaluated by DIS. Repairs are made easy, though time consuming, with the aid of the manufacturer's documentation in combination with the unit's resident diagnostics capability. Clinical evaluators had difficulty with the "foot mouse" rheostat and the increased complexity of the unit. While the evaluators appreciated having all controls conveniently located on one easily disinfected panel, the international icons and logic flow of the system presented difficulty for the evaluators in a short-term evaluation. Compared to other units they had used, three of the four evaluators rated the Pelton & Crane Spirit S1 only "poor" to "fair". As a result, three of the four clinical evaluators gave an overall rating of either "poor" or "fair". Only one of the four evaluators stated they would purchase the unit. The **Pelton & Crane Spirit S1 Dental Unit** is rated **Acceptable** for use by the federal dental services.