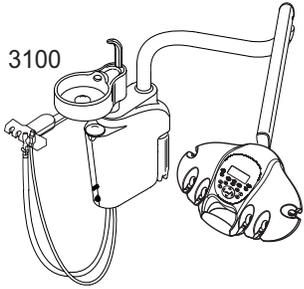


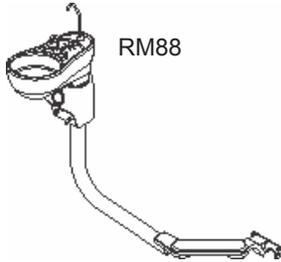
# *Pelton & Crane*

## Spirit 3000 Delivery System Specifications

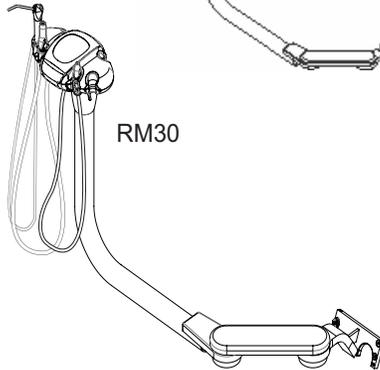
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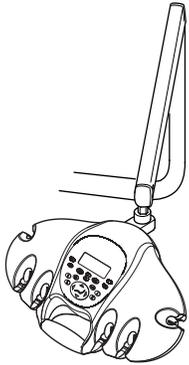
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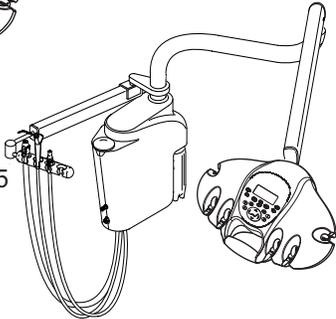
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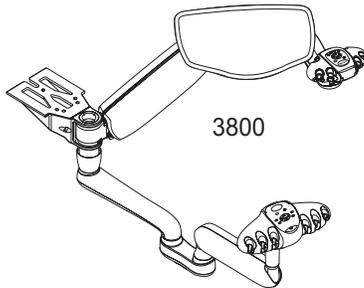
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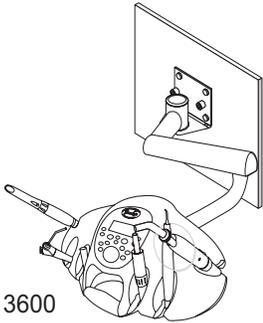
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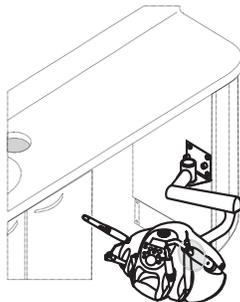
3800



3600



3610



### **Catalogs:**

3100, 3105, 3120, 3600, 3610, 3800, 3810, 3820, RM30, RM30S,  
RM87, RM88, RM89, RM89S

## **1.00 GENERAL (Delivery Systems)**

**1.01** The Spirit 3000 Series Dental Systems shall have combinations of quality and innovative design with the simplicity of air and water controlled operation, smooth asepsis designs, and easy maintenance. The stylish designs shall have practical functionality by offering the features that are needed to facilitate an efficient and productive operatory. These dental units shall also have components used to carry, position, and control the devices used in the practice of dentistry.

**1.02** Spirit 3000 Delivery Systems shall easily mount to a dental chair, cabinet or wall and be capable of accepting an assistant's instrumentation.

**1.03** Air, water, vacuum and power for the delivery unit shall be supplied from the junction box. The J-box shall be located on the floor or in a cabinet sub-base. It shall be equipped with air/water regulators, filters and shut-off valves.

**1.04** The delivery unit shall have a wet/dry foot control. Chip air blower shall come as an option.

**1.05** The delivery unit shall operate on low voltage (24VAC and 36VDC) Transformers shall be located within the j-box. A pre-wired 8-conductor cable shall provide necessary power to the delivery head accessories.

**1.06** Catalogs 3000 shall come standard with a self-contained water system with a city water or bottled water selector.

**1.07** The over-the-patient (OTP) delivery units shall be mounted to a PMU (3100, 3105) or to an ellipse pole (3120). The side delivery units shall mount to a cabinet (3610) or wall (3600). The rear delivery units (3800, 3810, 3820) shall be mounted to a rear cabinet.

**1.08** These units shall have the capability to integrate an optional flat-screen monitor, keyboard tray, scaler, curing light, camera, electric motor and the Vista Clean™ clean water system that is a continuous sanitation system when the dental unit is in operation.

**1.09** All Spirit 3000 series catalogs shall be Class I (US), Class IIa (EU) products and conform to the applicable requirements of IEC/EN/UL/60601-1 and CSA C22.2 no. 601.1.

**1.10** The delivery system is designed to be compatible with air-driven handpieces that conform to ISO13294 and electric handpieces that will conform to ISO11498. The air-driven handpiece tubing shall be available in 4-hole Midwest connection. The electric handpiece tubing shall have an E-type coupler.

## **2.00 GENERAL (Assistant's Instrumentation-PMU)**

**2.01** The Assistant's Instrumentation will consist of one saliva ejector (SE), one high volume evacuator (HVE) and a quick-clean with the option to change to an autoclavable syringe. It will feature an instrument hanger and smooth, removable HVE and SE ejector tubing and solids collector.

**2.02** The assistant's instrumentation shall be equipped with a vacuum system.

**2.03** The PMU-mounted unit will interface with the Over-The-Patient Delivery System. Air and water tubing for the assistant's instrumentation will channel through a post-mount unit (PMU) which will be connected inside the junction box.

**2.04** The instrument hanger will accept two autoclavable HVEs, an autoclavable SE and a quick-clean syringe. The hanger shall be supported on a telescopic arm or cuspidor-mounted arm.

**2.05** The PMU shall have optional cuspidor. The cuspidor shall include a one-piece porcelain coated bowl. It shall have pneumatically timed control wash and manual cup fill. Bowl rinse flow control shall be manually adjusted. The cuspidor shall employ removable cup fill and bowl wash spouts for ease of cleaning and disinfecting. The bowl rinse spout shall provide an air gap between it and the bowl surface as an anti-retraction measure.

**2.06** The cuspidor mounting arm shall be integrated in the bowl design and shall be pivot-mounted for horizontal rotation. Should the cuspidor be lowered onto a stool or other object, a break-away joint shall allow the cuspidor to pivot up, preventing damage to the equipment. The PMU shall accompany the cuspidor to provide air and water hook ups. It shall permit the addition of an aseptic vacuum system mounted on a folding extension arm and additional options.

**2.07** The PMU shall interface with the Over-The-Patient Delivery System. Electrical wiring and air/water tubing for the control head shall channel through the PMU which shall be connected to a junction box by an umbilical.

## **3.00 GENERAL (Assistant's Instrumentation RM30, RM30S, RM87, RM88, RM89, RM89S)**

**3.01** The RM30/RM30S shall be an optional rear-mount for assistant's instrumentation on dental units. It shall have six instrument positions. It shall support optional curing light and camera along with the assistant's instrumentation. A touchpad for the chair and light shall be standard. The RM30 and RM30S shall not support a cuspidor.

**3.02** The dental unit shall also have options to mount the assistant's instrumentation on RM87, RM88, RM89 or RM89S.

**3.03** The rear delivery units shall have assistant's instrumentation that move independently of the delivery head, The assistant's head shall be the same as the RM30, with the exception of the support.

**3.04** The assistant's instrumentation will consist of one saliva ejector (SE), one high volume evacuator (HVE) and a quick clean syringe with the option to change to an autoclavable syringe. A second HVE shall be optional.

**3.05** The vacuum system will be available to install to the OTP units and rear delivery units.

**3.06** The assistant's instrumentation will interface with the Over-The-Patient Delivery System. Air and water tubing for the assistant's instrumentation will channel through an ellipse post which will be connected inside the junction box.

**3.08** The instrument hanger will accept two autoclavable HVEs, an autoclavable SE and a quick-clean syringe.

**3.09** The optional cuspidor shall be available on RM88, RM89 or RM89S. The cuspidor shall include a one-piece porcelain coated bowl. It shall have pneumatically timed control wash and manual cup fill. Bowl rinse flow control shall be manually adjusted. The cuspidor shall employ removable cup fill and bowl wash spouts for ease of cleaning and disinfecting. The bowl rinse spout shall provide an air gap between it and the bowl surface as an anti-retraction measure in keeping with the corporate regulatory approval process.

**3.10** The cuspidor mounting arm shall be integrated in the bowl design and shall be pivot-mounted for horizontal rotation. Should the cuspidor be lowered onto a stool or other object, a break-away joint shall allow the cuspidor to pivot up, preventing damage to the equipment. The ellipse post mount shall accompany the cuspidor to provide air and water hook ups. It shall permit the addition of an aseptic vacuum system mounted on a folding extension arm and additional options. An optional touchpad shall be mounted to the rear mount.

**3.11** The ellipse post-mount shall interface with the Over-The-Patient Delivery System. Electrical wiring and air/water tubing for the control head shall channel through the post which shall be connected to an internal umbilical that shall connect into a junction box.

## 4.00 OPERATIONS (Delivery System)

**4.01** The **control head** shall utilize a pneumatic valve system to activate and deactivate drive air, chip air and coolant water/air. It shall be activated with the ON/OFF switch located on the underside of the control head and provide a means of disabling all handpieces and turning off the water supply coming from the utility area. Flow controls for air and water are located on the underside of the delivery head.

The **Control Head** shall have automatic activation of a selected handpiece and shall be controlled by a pilot air valve located in the handpiece holder. The entire control head may be draped in clear plastic during a procedure.

**4.02** **Water flow control system** shall use a check valve to ensure the unit meets current CDC requirements related to water retraction.

**4.03** The system shall be configured to five handpiece positions which supply drive air, chip air and coolant water/air for all handpiece positions; with or without syringe, and fiber-optic. A total of six positions shall be available, including the syringe.

**4.04** The **syringe** shall be a standard quick clean syringe or the option to upgrade to an autoclavable syringe. The syringe shall be autoclavable or disposable. The syringe tip shall be autoclavable or disposable.

**4.05** The main air/water control block (Quin Block) shall be equipped with individual handpiece pressure adjustment knob.

**4.06** Tubings shall be attached to metal barb fittings and shall be secured with plastic sleeves to prevent leakage.

**4.07** The **handpiece tubing** shall come standard with smooth straight, asepsis tubing. Tubings are compatible for air and water transport. Each handpiece tubing shall have individual, non-retracting water flow controls.

**4.08** **Utilities** to support the doctor's control head shall be provided in a junction box or cabinetry depending on the control head's configuration. They shall include air filter, regulator, pressure gauges and automatic shut-off. The delivery head shall be equipped with a USB port. A 300 watt transformer shall provide power to the dental unit.

**4.08a** **Water and air connections** at the junction box shall be 1/2" O.D. copper tubing with 1/2" NPT male fitting. Stub up shall be 1" max. on air and water lines protruding from the finished floor surface. Air pressure shall be set at 80 psi and water pressure shall be set at 40 psi.

**4.08b** **Drain connection** shall be 5/8" O.D. copper tubing, type L (.045 wall thickness). Stub up shall be 1" max. on drain line protruding from the finished floor surface. Elbow connection shall be soldered in place.

**4.08c** **Vacuum connection** shall be 5/8" O.D. copper tubing, type L (.045 wall thickness). Stub up shall be 1" max. on drain line protruding from the finished floor surface. Elbow connection shall be soldered in place. Vacuum activation shall be accomplished with a low voltage wire close to incoming vacuum line.

**4.09** **Foot control** shall provide optional chip air or drive air and coolant water/air and shall be capable of shutting the coolant water/air on and off.

**4.10** **Delivery Arm** shall be 2" diameter post that supports the control head. A counter-balance spring and pneumatic braking system shall provide a minimum of 28 1/4" of vertical travel at the control head. The arm shall feature a utility channel which shall conceal all tubings and wires required for the operation of the unit. The delivery head shall be easily positioned by the movements the arms provide. The flex arm shall come factory adjusted, but may need readjustment over time.

**4.11** **Flex Arm Brake** shall be pneumatically-controlled air lock/release button. This button will be located conveniently on the delivery head handle.

**4.12** **Articulating Tray** shall have outside dimensions of 14" wide X 10 1/4" long. The inside dimensions shall be 12 1/2" wide X 8 1/2" long X 1/2" deep and shall be available to mount on the control head for over-the-patient and side delivery applications. It shall accommodate a Ritter size "B" tray and shall be autoclavable. The swivel shall rotate 360° for optimum positioning. Extension from the pivot point shall be 11". The tray shall have an anti-skid mat.

**4.13** **Optional Fiber-optic** control shall be available to accommodate up to four handpiece positions. The smooth, straight fiber-optic handpiece tubing with quick disconnect and swivel shall provide lighting for each handpiece. European-style fiber-optic tubing shall also be available as an option. The handpiece control system shall provide, through variable potentiometers, the means to select the optimal control voltage for the lamp, based on the manufacturer of the handpiece.

**4.14 Optional Curing Light** shall activate when handpiece is lifted from its holder. It shall convert electrical power into a visible blue flux without generating large quantity of heat associated with Halogen lamps. Electronic Beam Light Emitter Diode (LED) provides optimal blue light used to excite the camphoroquinone photo-initiator which has an absorption peak at 468nm. This stimulates the production of free radicals from the tertiary amine, resulting in the polymerization and hardening of the polymer composite.

**4.15 Optional Scaler:** The piezoelectric or magneto ultrasonic scaler shall be designed for integration with 3000 delivery system. The handpiece is mounted on the instrument holder of the control head. Power level adjustment knob is located on the control head. The handpiece is activated with the foot control once the handpiece is removed from the holder. The piezo scaler comes with scaling tips and wrenches for inserting and removing the tips. The dental light shall be activated using the button with the light symbol (the toggle switch on the dental light head must be in the "on" position for this function to operate).

**4.16 Touch Pad:** The touch pad allows the user to adjust the chair's positioning using the directional arrows shown. The user can also program and access the chair's automatic positions using the program buttons. The light can also be remotely activated using the button with the light symbol (the toggle switch on the dental light head must be in the "on" position for this function to operate). The 3600 and 3610 shall have an under-floor touchpad cable that runs to the chair. The touchpad shall be centrally located for ease of operation.

**4.17** The Spirit 3000 unit shall be equipped with an optional, integrated e-motor (KaVo ET-TLC) It shall be used for high-speed and endo-procedures (100rpm to 40,000rpm). Up to six speeds shall be programmable and it shall have a display board. The e-motor shall be equipped with a touchpad to adjust speed, torque, LED light voltage and to program speed. E-motor and chair touchpads shall be centrally located for ease of operation. The e-motor shall have its own power supply (36VDC, 120W).

**4.18** The 3800 shall also support a second e-motor (COMFORTdrive). This optional e-motor shall be for high-speed procedures (up to 40,000rpms). The e-motor, unlike the ET-TLC, shall be integrated into the handpiece. The COMFORTdrive shall have its own power supply (36VDC, 120W). It shall require no touchpad to operate. The e-motor shall be activated by the foot control and shall be switched off by the delivery head master ON/OFF switch.

**4.19** Spirit 3000 shall have a self-contained water supply system. The system shall provide water from a bottle or from a city line. Water bottle shall be 750ml or 2 liter size.

**4.20 Purge Switch** is a toggle switch located on the underside of the control head. This switch shall activate a purging function in which water is flushed through the selected handpiece tubing. Only selected handpieces shall be purged.

**4.21** The handpiece (HP) holders shall provide dual positions (90° and 45°) for doctor's preference and HP separation.

**4.22** The Spirit 3000 delivery head shall support an optional camera. The unit shall be equipped with an I/O camera HP, high integrity cables and a docking station. Docking station may

be connected to a monitor or computer for output display.

**4.23 Handpiece Oil Collector** is located underside of control head. It shall collect the excess oil coming from the handpieces. The gauze is placed inside the canister to absorb the excess oil.

## **5.00 OPERATIONS (Assistant's Instrumentation - PMU)**

**5.01** Telescoping Arm Instrument Holder (3105) shall be able to swivel along-side of the chair to accommodate Doctor's or Assistant's preferences.

**5.02** Cuspidor-mounted Instrument Holder (3100) shall swivel with the cuspidor and to each side of the cuspidor for set-up preferences.

**5.03** The HVE, SE, and optional syringe can hang in any of the four positions in the instrument holder.

**5.04** The HVE will accept disposable and non-disposable tips with tip insertion end having outside diameter of 7/16".

**5.05** The SE valve will accept disposable and non-disposable tips with an outside diameter of 1/4".

**5.06** The debris cup cover shall seal to the top of the cup to maintain vacuum to the HVE and SE valves.

**5.07** Debris Cup shall accept a disposable or cleanable strainer.

**5.08 The Cuspidor** shall use a pneumatic control system for bowl rinse and cup fill. The bowl shall consist of a cup fill pad and an outer perimeter dam to contain all fluids. All horizontal surfaces shall slope into the bowl to permit ease of cleaning of the entire bowl top. The cuspidor bowl shall contain the momentary button for the cup fill and bowl rinse.

**5.09 Post Mount Unit (PMU) Cuspidor** shall be mounted into the top of the PMU. The control valves for the water outlet and water outlet flow control valves mounted to bracket in the PMU.

**5.10 Water Outlet:** The water outlet is provided to run any accessories needed by the user. Use the supplied 1/4" male connector and attach to the outlet.

**5.11 Water Outlet Flow Control:** This is a valve that adjusts the water flow of the outlet.

## **6.00 OPERATIONS (Assistant's Instrumentation - RM30, RM30S, RM87, RM88, RM89, RM89S)**

**6.01 The RM30/RM30S** shall be able to swivel along-side of the chair to accommodate Doctor's or Assistant's preferences. It shall have six positions for the assistant's instruments, for curing light and for camera. The ellipse mount assistant's head shall also have a touchpad for the chair. A low-voltage power cable shall run through the assistant's umbilical to deliver power to the accessories. It shall not support a cuspidor and, hence, shall have similar structure to that of RM87. The RM30 and RMS30 shall be mounted to the 3000 and 1800 Chairs.

**6.02** The RM87, RM88 RM89 and RM89S shall also be optional rear mounts that go with the ellipse dental unit. Cuspidor mounted **Instrument Holder** shall swivel with the cuspidor and to each side of the cuspidor for set-up preferences.

**6.03** The HVE, SE and optional syringe can hang in any of the six positions in the instrument holder. All rear mount units, except RM88, shall be equipped with HVE, SE and syringe.

**6.04** The HVE will accept disposable and non-disposable tips with tip insertion end having outside diameter of 7/16”.

**6.05** The SE valve will accept disposable and non-disposable tips with an outside diameter of 1/4”.

**6.06** The debris cup cover shall seal to the top of the cup to maintain vacuum to the HVE and SE valves.

**6.07** Debris Cup shall accept a disposable or cleanable strainer.

**6.08 The Cuspidor (RM88, RM89, RM89S)** shall use a pneumatic control system for bowl rinse and manual cup fill. The bowl shall consist of a cup fill pad and an outer perimeter dam to contain all fluids. All horizontal surfaces shall slope into the bowl to permit ease of cleaning of the entire bowl top. The cuspidor bowl shall contain the momentary button for the cup fill and bowl rinse. The RM88, RM89 and RM89S shall be equipped with a cuspidor.

**6.09 Ellipse Rear Cuspidor** shall be easy to move as it is swiveled to the preferred left or right side of the dental chair. The control valves for the water outlet and water outlet flow control valves shall be located underneath cuspidor.

**6.10 Bowl Rinse/Cup Fill Activation Button** shall have a smooth contoured button that activates the automatic bowl rinse cycle or cup fill.

**6.11 Timed Bowl Rinse** shall be controlled by the pneumatics control located at the top of the cuspidor. The activation switch shall turn bowl rinse water on. The rinse time period shall be factory set from 25-35 seconds. A time adjustment valve shall to adjust rinse time is located in under the cuspidor or inside the PMU.

**6.12 Cup Filler:** This function is activated by pressing the activation button until the pilot valve is activated. Release the activation button to de-activate the cup fill.

**6.13 Water Outlets:** The water outlet is provided to run any accessories needed by the user. Use the supplied 1/4” male quick disconnect and attach to the outlet.

**6.14 Water Outlet Flow Control:** This valve shall adjust the water flow of the outlet.

**6.15 Touch Pad** on RM87, RM89, RM89S shall be optional. The electronic touchpad allows the user to adjust the chair’s manual positioning using the directional arrows shown. The user can also program and access the chair’s automatic positions using the buttons labeled 0 and 1 and the unmarked LEARN button. The light can also be activated using the button with the light symbol (the toggle switch on the LF light head must be in the “on” position for this function to operate).

## 7.00 CONSTRUCTION (Delivery)

**7.01 Control Head** lower housing shall be made of cast aluminum.

**7.02 Handpiece Holder** upper housing will be made of ABS blended material. Holders are molded to position the handpieces upright or at 45°.

**7.03 Control Head Front Arm** shall be made of steel tube. The lower housing shall be bolted onto it.

**7.04 Air and Water Control** manifolds and fittings inside the delivery head shall be constructed of nickel-plated brass to prevent corrosion.

**7.05 Flex Arm Housing** shall be constructed of extruded aluminum. Surface shall be powder-coated to prevent corrosion. The arm shall mount into a 2.0” diameter post attached to a steel mounting bracket (3120) or into a PMU (3100, 3105).

**7.06 Junction Box** will be made of ABS plastic cover with powder coated aluminum cast frame.

**7.07 Air/Water Tubings** will be made of Polyurethane or Polyethylene.

**7.08 Tray Mount Option** arm will be made of aluminum casting that attaches the control head front arm. The tray holder will be made of 1/8” aluminum that will be powder coated finish in light gray. The tray will be made of stainless steel sheet. An anti-skid mat will be provided.

**7.09 Foot Control** will be made of durable chrome-plated cover and a metal base with 7” polyurethane 3-hole/4-hole tubing.

**7.10 PMU Framework (3100, 3105)** shall be of metal casting. The covers shall be made of injection-molded plastic. Magnets are used to keep covers in position.

**7.11 The Pneumatic Control Block** shall have five positions. It shall be constructed of brass plated with nickel.

**7.12** All fasteners shall be made of stainless steel or plated steel.

**7.13** All units shall be equipped with 750ml or 2 liter seamless water bottles made of blow-molded plastic. The thread meets beverage standard and bottle is tested to 120psi.

**7.14** The doctor’s and assistant’s arms in the 3800 delivery units shall move independently. The assistant’s arm shall be built with heavy-gauge spring to support heavy countertops. The unit is supported with sturdy steel structure that fits into a rear cabinet.

**7.15** The side delivery and rear delivery (3600) is mounted to a cabinet. The 3610 delivery shall be mounted to a wall.

## **8.00 CONSTRUCTION (Assistant's Instrumentation - PMU)**

- 8.01** The instrument hanger will accept two autoclavable HVE's, an autoclavable SE and a quick-clean syringe.
- 8.02** The debris cup will contain molded fittings which will mate to connections on the HVE and SE for removal of the hose.
- 8.03** Tubings will be a smooth, polyurethane aseptic with a 1/2" inside diameter. The smooth SE tubing will be supplied with a quick-disconnect fitting on the debris cup for ease of removal for cleaning.
- 8.04** HVE Valve will be constructed of aluminum with an anodized finish and will have an independent on/off and flow restrictor shut-off lever on the valve body. The HVE will accept disposable and non-disposable tips with tip insertion end having outside diameter of 7/16"
- 8.05** Saliva Ejector Valve will be constructed of aluminum with an anodized finish with an independent on/off shut off lever located on the valve body. The SE valve will accept disposable and non-disposable tips with an outside diameter of 1/4".
- 8.06** Utilities and Umbilical will be contained inside the junction box or sub-base of the cabinet.
- 8.07** Drain and vacuum tubing shall be made of PVC.
- 8.08** Telescoping arm shall be constructed of 1/2" chrome polished steel rod, 1/8" aluminum extrusion tube with white Delrin holder. The holder shall have four positions.
- 8.09** The Cuspidor bowl shall be made of ceramic with porcelain glaze.
- 8.10** The PMU shall support the cuspidor, unit pole, system light and/or monitor.

## **9.00 CONSTRUCTION (Assistant's Instrumentation - RM30, RM30S, RM87, RM88, RM89, RM89S)**

- 9.01** The instrument hanger will accept two autoclavable HVE's, an autoclavable SE and a quick-clean syringe.
- 9.02** The debris cup will contain molded fittings which will mate to connections on the HVE and SE for removal of the hose.
- 9.03** Tubings will be a smooth, polyurethane aseptic with a 1/2" inside diameter. The smooth SE tubing will be supplied with a quick-disconnect fitting on the debris cup for ease of removal for cleaning.
- 9.04** HVE Valve will be constructed of aluminum with an anodized

finish and will have an independent on/off and flow restrictor shut-off lever on the valve body. The HVE will accept disposable and non-disposable tips with tip insertion end having outside diameter of 7/16"

- 9.05** SE Valve will be constructed of aluminum with an anodized finish with an independent on/off shut off lever located on the valve body. The SE valve will accept disposable and non-disposable tips with an outside diameter of 1/4".
- 9.06** Utilities and Umbilical will be contained inside the junction box or inside the sub-base of a cabinet.
- 9.07** Drain and vacuum tubing shall be made of reinforced PVC. Air and water lines shall be made of Polyurethane or Polyethylene material.
- 9.08** The RM88, RM89, RM89S post shall be constructed of 2 1/4" diameter tubular steel when configured with cuspidor.
- 9.09** The ellipse pole shall be mounted to a steel plate articulating arm. The link shall be connected to a steel structure bracket which shall be mounted to the rear end of the chair. Links shall have roller bearings sandwiched between mounting bracket and post to provide rotation of the RM30, RM30S, RM87, RM88, RM89 and RM89S around the chair. When no cuspidor is configured, the post and the links shall be constructed of 1 1/2" diameter tubular steel.
- 9.10** The pole, link and bracket shall come with powder coated finishes.
- 9.11** The assistant's head on RM30, RM30S and similar rear mounts shall be made of molded ABS plastic material. All of the vacuum system components shall be of plastic material to prevent corrosion.