

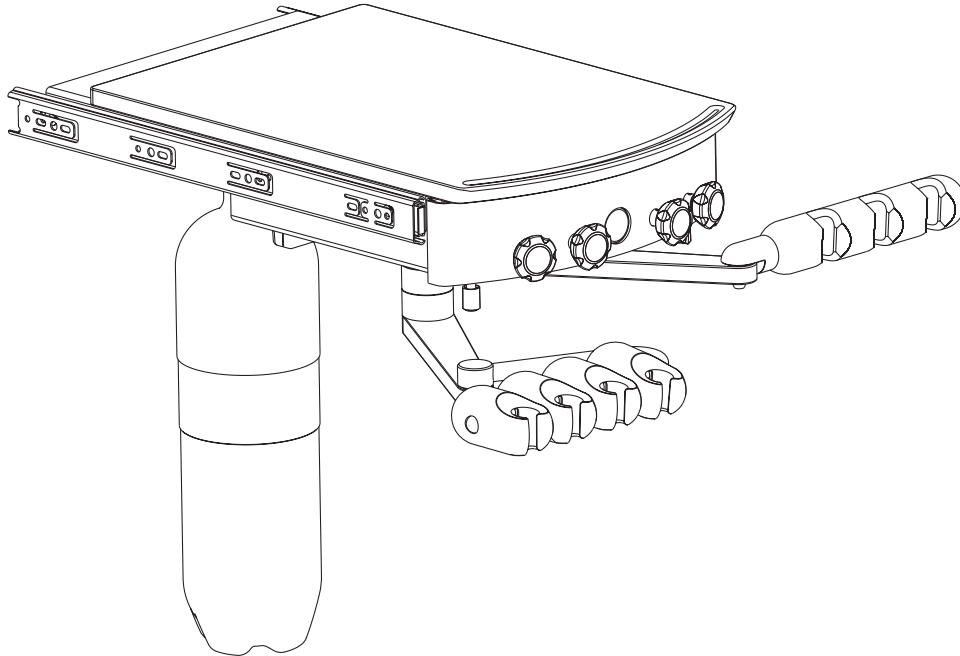
**SERIES 4 12 O'CLOCK UNDER COUNTER
DENTAL DELIVERY SYSTEMS**

OVERVIEW

DR4050 12 O'Clock Slide Out Delivery with Dr & Assistant's Instruments

DR4051 12 O'clock Slide Out Delivery with Assistant Instruments

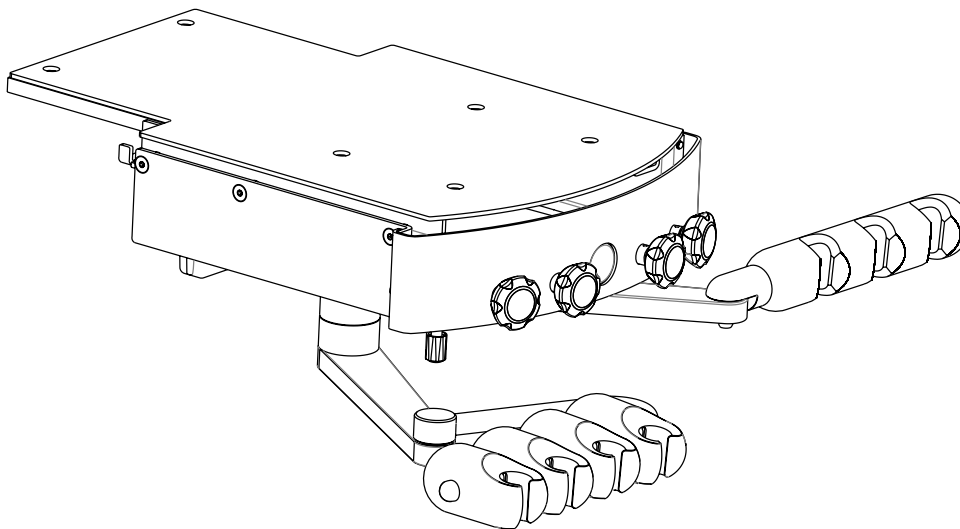
DR4052 12 O'clock Slide Out Delivery with Dr Instruments



DR4150 12 O'Clock Fixed Delivery with Dr & Assistant's Instrumentation

DR4151 12 O'clock Fixed Delivery with Assistant Instruments

DR4152 12 O'clock Fixed Delivery with Dr Instruments



INTRODUCTION

SYMBOLS

The following symbols may be used throughout this product manual:



























-  **WARNING:** Failure to carefully follow the described procedure may result in damage to the equipment or the operator.
-  **CAUTION:** Failure to carefully follow the described procedure may result in damage to the equipment.
-  **NOTE:** Take note of additional important information. Not a warning or caution.
-  **ELECTRICAL HAZARD:** Risk of electrical shock present. Ensure that power is disconnected before attempting procedure.
-  Manufacturer
-  Manufacturing date
-  Type BF applied part
-  Waste Electrical and Electronic Equipment
-  Class I ME Equipment
-  Alternating Current (AC)
-  Conforms to applicable European Directives (Essential Requirements)
-  Electrical Testing Lab
-  Advisable to consult accompanying documents
-  Chair Function: Directional movement
-  Chair Function: Chair pre-set position keys 0 and 1
-  Program key
-  Light Function: Light ON/OFF toggle
-  Chair Function: Return to last position key
-  Air Flow Control
-  Cup Fill
-  Water Flow Control
-  Bowl Rinse
-  Scaler Control
-  Master On/Off
-  Micro Motor Control
-  Flush

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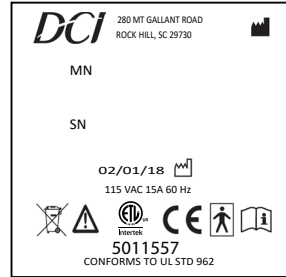
GENERAL INFORMATION

INTENDED APPLICATION AND USE

The dental delivery system is a device intended to support the instruments used by the dental practitioner, delivering those instruments to an accessible position during a dental procedure. This device may control and be the means of delivering compressed air, water, vacuum and low voltage electricity to a variety of instruments commonly used in dental practice.

PRODUCT IDENTIFICATION

This device can be identified by the label on the underside of the dental delivery system head. This label states the model number, serial number, electrical specifications, manufacturing date, software version, and safety classifications. Note the **sample** label at right.



APPLICABLE MODEL

DR4

ELECTRICAL SPECIFICATIONS

100-240VAC .6 Amps 50-60Hz	IEC Medical Classification I TYPE: BF Power optics Splash Protection: IPX0
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ACCESSORY DEVICES:

Power Optics:

Operation: Intermittent
Duty cycle: 20 sec ON, 10 sec OFF, 10X/hr

AIR AND WATER SUPPLY

AIR Air Quality: Dry and clean Pressure: 80-105 psi	WATER Water Quality: Potable Hardness: 7.2 - 7.8 pH Pressure: 40-80 psi
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ELECTRICAL DEVICE INTERFERENCE

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 dental delivery systems or x-ray dental delivery systems may effect performance. If performance problems occur, move the dental delivery system to another electrical circuit or physical location.

ENVIRONMENTAL CONDITIONS

Operating Conditions:
Temperature: 67-76° F
Humidity: 20-60%

Shipping conditions:
Temperature: -68 - 122° F
Humidity: 10-90%

TECHNICAL DOCUMENTATION

The manufacturer will make available upon request circuit diagrams, component part lists, descriptions, and calibration instructions to technical personnel responsible for the installation and service of this equipment.

PRODUCT DISPOSAL

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

PREVENTATIVE INSPECTION

The performance of the equipment can be affected by use over time. Periodically inspect the water and air lines for visible cracks or cuts and inspect for loose fittings and fasteners which could lead to leaks or other poor performance characteristics. Inspect joints and tensioning screws as a regular maintenance item to ensure proper positioning of the device.

GENERAL SAFETY

WARNINGS & CAUTIONS



WARNING: This product must be disinfected before use.



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



CAUTION: Use a licensed electrician for all wiring.



WARNING: Modification of this equipment is not allowed.



WARNING: Failure to disinfect this device between patients could expose the user and patient to cross contamination and bio-burden/biocontamination.



WARNING: Power cords and their associated parts cannot be substituted without increase risk of shock or fire. Use authorized replacement parts only. Power cords must be installed by qualified personnel. Ensure all service loops, strain reliefs and cord guards are in place and that line and neutral wires are secured.



WARNING: Failure to return handpieces to their proper locations 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 cleaning debris trap.



WARNING: Do not allow children unsupervised access to the dental delivery system and auxiliary equipment.



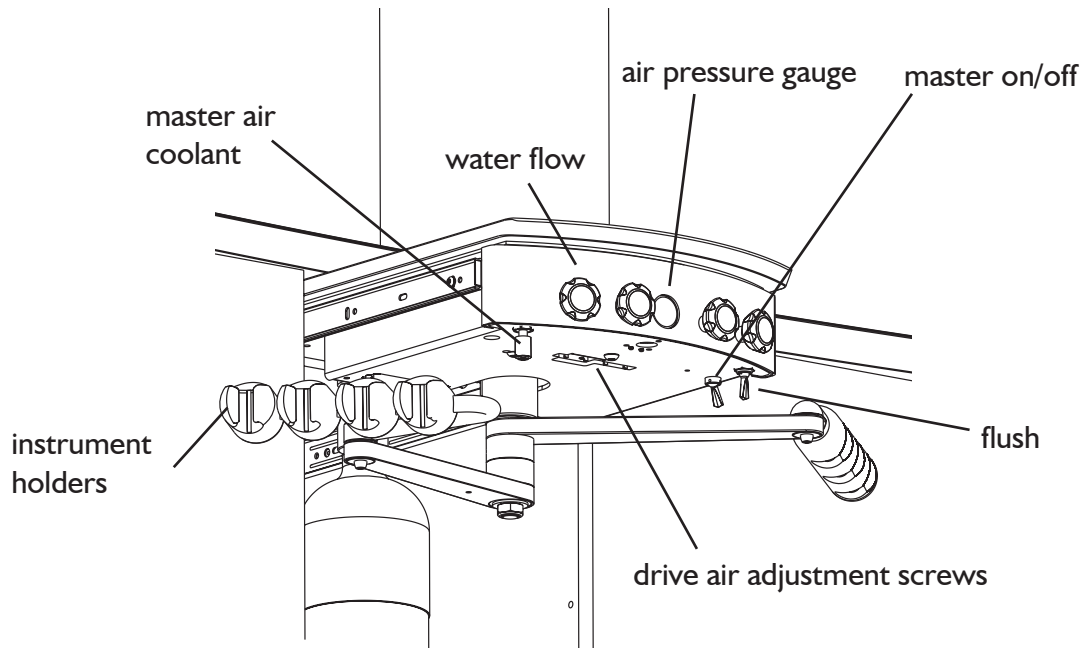
NOTE: This product is intended for use by trained dental/medical professionals only.



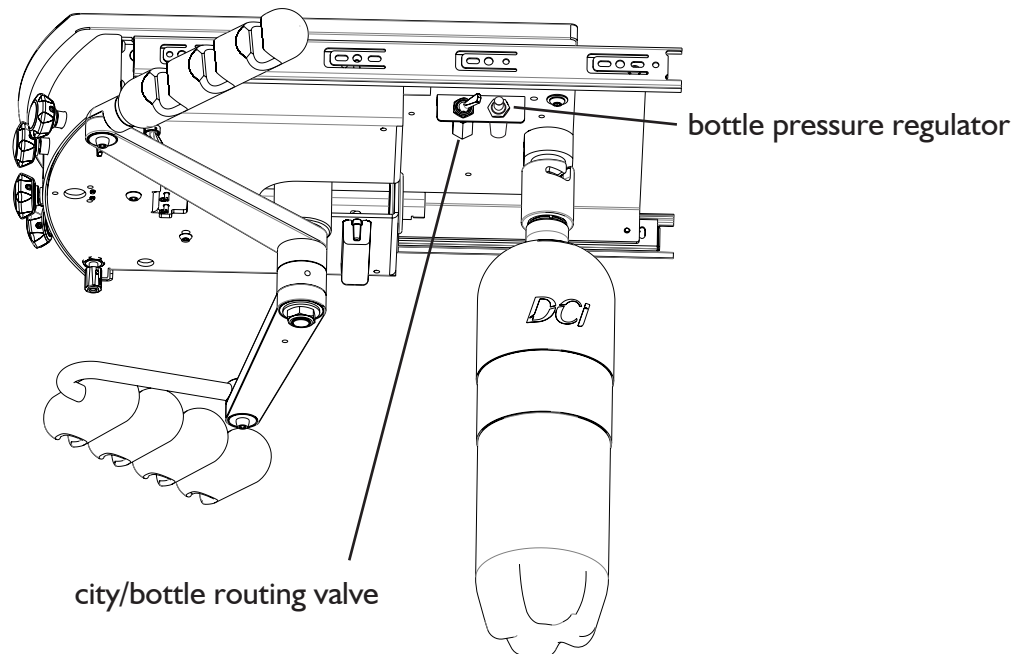
WARNING: To isolate from mains power, unplug the cord. Make sure to leave the mains cord accessible.

OPERATION - CONTROL HEAD

CONTROLS



Built-In Water Manifold and Controls for Slide Out Models Only (DR4050, DR4051, DR4052)



OPERATION - UTILITIES

CONTROLS

CONTROL HEAD: All of the operating controls are located on the underside of the control head where they are sheltered from most airborne contaminants.

MASTER ON/OFF: Located on the right side of the control head towards the front, this toggle switch activates the air and water shut-off valves, which control the air and water supplies to the dental delivery system.



CAUTION: When not in use, **ALWAYS** turn the Master On/Off switch to the Off position. The master switch is an important safety device that must be utilized in order to prevent accidental flooding.

FLUSH: Located on the right side of the control head of the Master On/Off, this momentary toggle is used to purge the coolant water from the handpiece tubing. Hold the handpiece tubing over a suitable container, then activate and hold the toggle for at least 30 seconds to flush out the handpieces.

AIR COOLANT FLOW CONTROL: Located on the left side of the control head, this master control valve adjusts the amount of air coolant flow to all of the handpieces. Rotate counterclockwise to increase flow, clockwise to decrease flow.

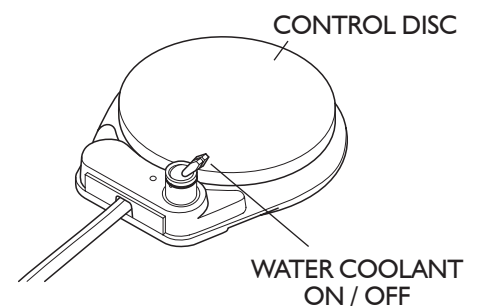
HANDPIECE FLOW CONTROLS: Located at the front of the control head, these individual control valves adjust the amount of water coolant supplied to its corresponding handpiece. Rotating the control valve counterclockwise increases water coolant, rotating the control valve clockwise decreases water coolant.

HANDPIECE HOLDERS: Handpiece selection is automatic. The handpiece auto-holders contain actuator valves that activate each handpiece when lifted from its holder, without the need for manual selection.

FOOT CONTROL

DRIVE AIR CONTROL: Dental delivery systems are equipped with wet-dry, variable speed, disc type foot controls. Foot pressure on any part of the foot control disc controls the flow of air to the active handpiece.

WATER COOLANT ON/OFF: This toggle interrupts the flow of water coolant to the handpieces when performing a procedure that requires dry cutting.



OPERATION - SELF-CONTAINED WATER SYSTEM

USING BOTTLED WATER

SELF-CONTAINED WATER SYSTEM

The self-contained water system allows you to isolate your practice from the municipal water supply. The self-contained water system uses a pressurized bottle to supply water to the dental delivery system, giving you full control of the source and quality of the water. A selector valve allows you to select either the city water supply or a bottled water supply of your own choice.

USING WATER BOTTLE

1. Ensure that the dental delivery system Master On/Off switch is turned OFF. Fill the water bottle to just below the neck, then install to the manifold. Turn the dental delivery system Master On/Off switch to the ON position and check for leakage at the bottle. If air or water leakage is observed, turn the dental delivery system Master On/Off switch OFF to release all pressure before tightening the bottle to stop leakage.
2. Select either city water or bottled water supply source, as desired, using the City/Bottle Selector on the dental delivery system.

REFILLING THE BOTTLE

1. Turn the dental delivery system Master On/Off switch to the OFF position and allow several seconds for air pressure to be released from the bottle. **Never attempt to unscrew the bottle while it is pressurized!**
2. After relieving pressure, remove the empty bottle and install a full bottle.
3. Turn the dental delivery system Master On/Off to the ON position and check for leakage at the bottle as previously described.



CAUTION: Only use water bottles supplied by the manufacturer. Do not use soft drink bottles which are thin walled and may rupture when under pressure.



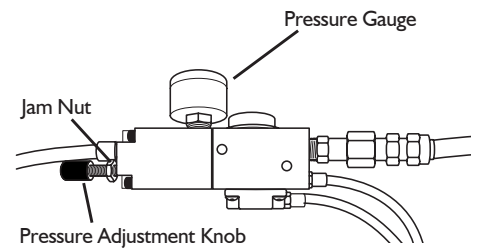
WARNING: Do not attempt to adjust the water bottle pressure. Bottle pressure is factory pre-set at 40psi. Pressurizing the water bottle over 40psi may cause the bottle to rupture.

ADJUSTMENTS

UTILITY CENTER

Located in the J-Box, the Utility Center comes factory preset at 40psi for Water pressure and 80psi for Air pressure. All regulator adjustments should be made with the Master On/Off in the ON position.

1. **TO INCREASE AIR AND/OR WATER PRESSURE:** Turn the knob clockwise to the desired pressure.
2. **TO DECREASE AIR AND/OR WATER PRESSURE:** Turn the knob counterclockwise to the desired pressure.

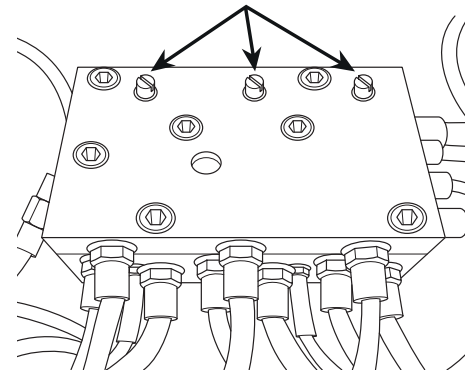


NOTE: When decreasing pressure, pressure must be relieved from the system. This may be achieved by pressing the syringe buttons to attain an accurate measurement from the gauges.

DRIVE AIR

1. Identify the adjustment knobs for controlling drive air on the underside of the control head as shown (right).
2. Install a bur in the handpiece that is to be adjusted. The drive air adjustment screws on the handpiece block correspond with the handpiece positions on the holder bar.
3. Run the handpiece. With the foot control plate fully depressed, turn the corresponding adjustment screw with a small slotted screwdriver. Clockwise to decrease pressure, counterclockwise to increase pressure.

DRIVE AIR ADJUSTMENT SCREWS



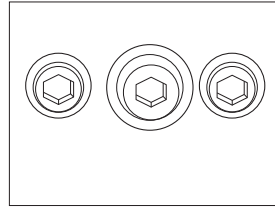
ADJUSTMENTS

DOCTOR'S SYRINGE

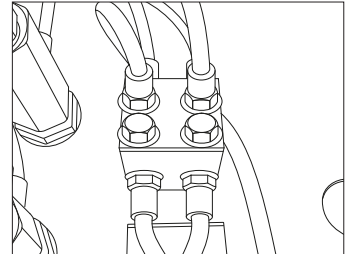
Adjusting screws allow you to control the flow of air and water from the syringe to prevent splashing and to achieve a desirable mist pattern. The adjusting screws are located under the dental delivery system head directly below the syringe control block.

1. Use a 3/32" hex key or the ball driver provided with the dental delivery system to make the syringe flow adjustment. Identify which adjusting screw is for air and which is for water by the color of the tubing connected to the block. Blue is water, yellow is air.
2. Adjust the water first, with the syringe button fully depressed. Turn the screw clockwise to decrease flow or counterclockwise to increase flow.
3. After adjusting the water to the desired flow, press both buttons simultaneously and adjust the air flow to achieve a mist pattern that suits your needs.

SYRINGE ADJUSTING SCREWS



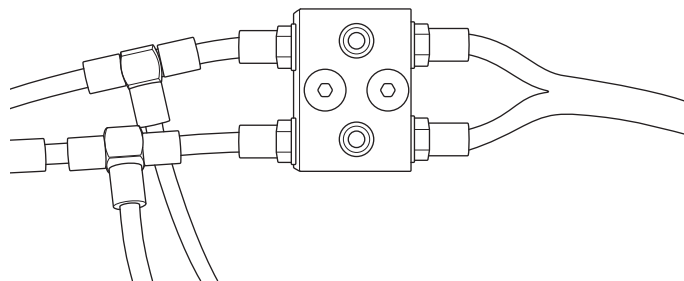
SYRINGE CONTROL BLOCK



ASSISTANT'S SYRINGE

The Assistant's Syringe Block is located on the back wall inside of the PMU, adjusting screws allow you to control the flow of air and water from the syringe to prevent splashing and to achieve a desirable mist pattern. Follow the steps above for the doctor's syringe block to adjust the Assistant's Syringe Block.

ASSISTANT'S SYRINGE BLOCK

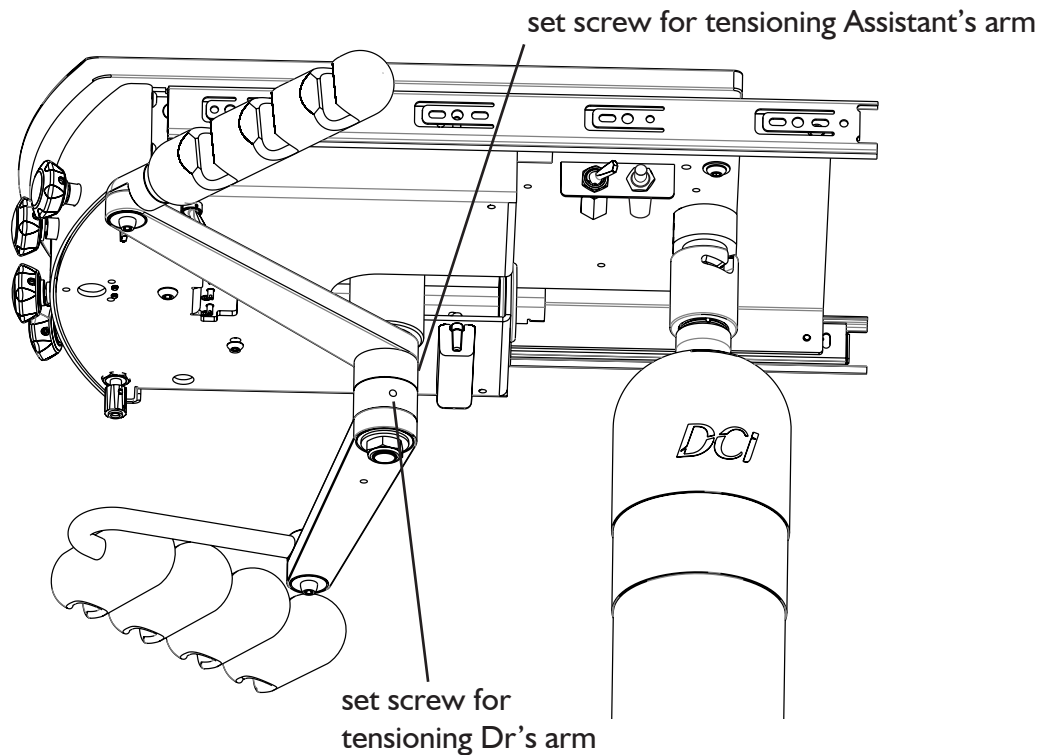


ADJUSTMENTS

ASSISTANT AND DR'S ARM TENSIONING

Rotational tension is preset at the factory, however it may be necessary to increase or decrease tension to suit the user's needs.

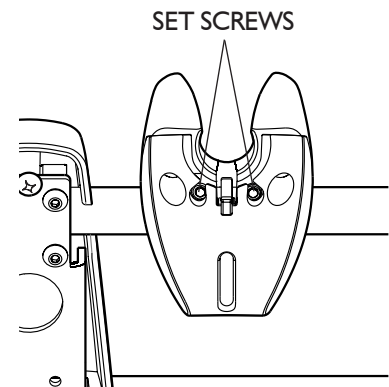
1. Using a 3/32" hex key, adjust tension on Assistant's arm by turning the set screw at the rear of the arm.
2. Using a 5/32" hex key, adjust the bolt at the bottom of the middle joint to adjust tension of the front Dr's arm.



HOLDER

The handpiece holders come pre-spaced and leveled from the factory, but may be re-positioned for the user's needs.

1. With a 1/8" hex key, loosen the two set screws located on the bottom of the holder.
2. Reposition the holder in the desired location.
3. Retighten the two set screws with the 1/8" hex key to secure the holder in position.



DISINFECTION AND STERILIZATION

BARRIER TECHNIQUE

Wherever possible, use disposable barriers and change them between patients. The barrier technique will ensure maximum long term durability of the surfaces and finishes of the equipment.

DISINFECTION & STERILIZATION

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 use of chemical disinfecting agents is not necessary if the instrument is going to be sterilized. While their use may be easy and quick, it is important to know the effectiveness of any chemical disinfectant against the various agents of infection that may be encountered.

CHEMICAL DISINFECTION

Follow the instructions below carefully to ensure the longest life for your equipment:

1. Only use the acceptable disinfectants listed. Use of unacceptable products will void your warranty.
2. Thoroughly wash all areas that have been exposed to disinfectant cleaners 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.
3. When using chemical disinfectants, always pay strict attention to the manufacturer's disinfectant directions.
4. When using concentrated disinfectants, measure the concentrate carefully and mix according to package directions.
5. Disinfectant solutions that are relatively harmless to surfaces at their recommended strengths can be corrosive at higher than recommended dilution ratios.

Conditionally Acceptable Disinfectants

- Phthalaldehyde
- Quarternary Ammonium
- Glutaraldehyde



CAUTION: These disinfectants will harm the surface finish of dental equipment and are not recommended.

Unacceptable:

- Strong Phenols/Phenol Alcohol combinations
- Sodium Hypochlorite/Household Bleach
- Sodium Bromide
- Strong Alcohol
- Household Cleaners (Dental Equipment Only)
- Citric Acids
- Iodophors
- Ammonium Chloride
- Accelerated Hydrogen (0.5%)

STERILIZATION

There are several methods of sterilization that may be used. It is important to remember, however, that regardless of the method you choose, temperatures should never exceed 275° Fahrenheit (135° Celsius). Any of the following sterilization methods may be safely used on your autoclavable instruments:

- Steam Autoclave
- Ethylene Oxide Gas
- Chemical Vapor Process

Do not allow the instruments to come into contact with the walls of the sterilizer. Avoid placing the instruments in close proximity to the sterilizer heating element. Dry heat sterilization is not recommended because of the difficulty in maintaining the precise temperature control necessary to prevent damage to the instruments.



CAUTION: When using the chemical vapor process, it is essential to rinse out all cleaning agents with clear water.

The internal surfaces and passages must be thoroughly purged of residual cleaning agents by flushing with water then isopropyl alcohol. This will prevent the formation of a crystalline residue resulting from reactions between the chemical vapor solutions and cleaning agents.

MAINTENANCE

GENERAL CLEANING

Equipment can be cleaned with a solution of mild detergent and warm water. A variety of surface disinfectants are available for use in dental treatment rooms. Some of these can cause discoloration of painted, plated or anodized surfaces with repeated use. This can be minimized by careful adherence to the disinfectant manufacturer's instructions and by frequent washing with soap and water.



CAUTION: Do not use powdered cleansers, scouring pads or abrasive scrubbers on any of the painted, plastic or metal surfaces of this dental delivery system. To remove dried-on material, use a soft bristled brush and a solution of mild detergent.

ASSISTANT'S VACUUM INSTRUMENTS

AFTER EACH PATIENT: Draw clear water through each valve, while opening and closing it several times. Leave the valve open for several seconds to allow all of the water to clear the hoses. The HVE and Saliva Ejector tips should always be replaced with sterile ones before each patient.

END OF EACH DAY: We recommend that you draw a vacuum system sanitizing solution through each valve, while opening and closing it. EcoVac is an effective vacuum system cleaner that is non-toxic and environmentally safe.

HANDPIECE FLUSH - DAILY MAINTENANCE

The dental delivery system is equipped with a handpiece flush system that allows you to periodically flush fresh water through the handpiece tubings. The need for this is caused by the low flow of water through the tubings during normal use, which can lead to stagnation and the potential growth of "biofilm" contamination.

It is recommended that you flush the tubings at the beginning and end of each day. This may be done with or without the handpieces installed, but having the handpieces on the tubings will restrict flow, so a longer flush time will be required. All of the tubings are flushed simultaneously. Hold them together and direct them into a basin, sink or cuspidor to catch the water. Flip and hold the flush toggle.

Allow adequate time for fresh water to make its way through the entire system and displace all standing water. The American Dental Association and the Centers for Disease Control can provide additional recommendations regarding this procedure, including information on frequency and duration of flushing and the use of antibacterial solutions in the self-contained water system.



WARNING: In order to mitigate the risk of cross-contamination between patients, disinfection and sterilization of handpieces **must occur after each dental procedure**. Refer to the handpiece manufacturer's instructions and recommendations for sterilization or disinfection procedure.

MAINTENANCE

DENTAL DELIVERY SYSTEM - WEEKLY MAINTENANCE

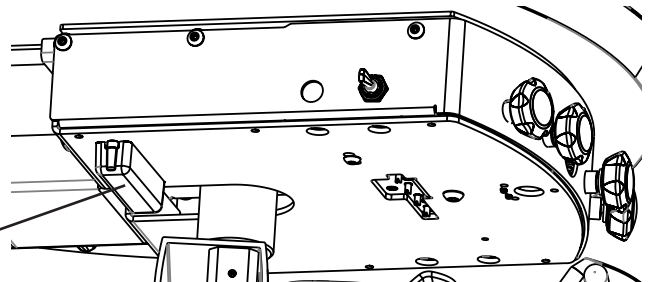
A cleaning procedure should be performed at least once a week, preferably at the start of the week before treating patients. If the dental delivery system is to be stored for any length of time, perform a weekly maintenance routine immediately before and after storage.

1. Purge the dental delivery system with air.
2. Flush the system with disinfectant solution:
 - a. Turn the dental delivery system Master switch to the off position. Empty the water bottle, replacing the water with cleaning solution.
 - b. Hold the handpiece tubing and syringe over the cuspidor or other suitable container. Turn the dental delivery system on, wait a few moments, then operate the flush toggle, syringe and foot control until a continuous stream of cleaning solution is running through the system.
3. Allow the disinfectant to remain in the dental delivery system for 10 to 20 minutes, then flush the system again until all the cleaning solution is used up.
4. Purge the dental delivery system with air:
 - a. Hold the handpiece tubing and syringe over a container. Turn the Master Switch to the On position, wait a few moments, then operate the flush toggle, syringe and foot control until all cleaning solution is purged from the system.
 - b. Turn the dental delivery system Master Switch to the Off position. (If the dental delivery system will be stored, stop here.)
5. Fill with clean water:
 - a. With the dental delivery system Master Switch turned to the Off position, remove the empty disinfectant bottle. Replace with clean bottle and clean water.
 - b. Hold the handpiece tubing over a suitable container. Turn the dental delivery system on, wait a few moments, then operate the flush toggle until a continuous stream of water is flowing through the system. Replace handpieces and do the same with the syringe. The dental delivery system is now ready for use.

HANDPIECE OIL COLLECTOR

Replace the 2" x 2" gauze pads with clean pads in the handpiece oil collector at least every 90 days, or more often if handpieces are oiled frequently. Remove the oil collector by pulling downward.

OIL COLLECTOR



MAINTENANCE

SOLIDS COLLECTOR

Turn off the vacuum pump. Remove the solids collector cap and lift out and dispose of the screen. If you find an excessive amount of material in the screen, more frequent cleaning is necessary.

SELF-CONTAINED WATER SYSTEM

The self-contained water system is designed to optimize the quality of water being delivered to the handpieces and syringes. The self-contained water system has three functions:

1. The system may be filled with filtered or sterile water for patient use.
2. The system may be filled with disinfectant for flushing the syringe and handpiece tubing.
3. The dental delivery system can be purged with air to inhibit the growth of biofilm.

In order to maintain a truly aseptic water system, daily and weekly cleaning procedures must be performed in a consistent, regular manner. Failure to do so could result in contaminated water lines and a lower water quality than what is acceptable for patient use. Follow a daily and weekly maintenance routine for proper cleaning of the tubing with the clean water system.

DISINFECTING THE BOTTLE



CAUTION: Disinfect new water bottle prior to first use.

Fill bottle with the 100 ml disinfectant solution, shake vigorously and let it settle for 10 minutes. Shake again, then rinse twice with water.

It is recommended that 100 ml of disinfectant solution is mixed for each weekly bottle disinfecting procedure. Always use a fresh mixture every week.

The Disinfectant Solution:

- 9 parts (90 ml) Tap water
- 1 part (10 ml) 5.25% Sodium hypochlorite (household bleach)

ELECTROMAGNETIC COMPATIBILITY

DEVICE COMPATIBILITY

ELECTRICAL MEDICAL

Electrical medical devices are subject to special EMC safety measurements and as a result the equipment must be installed according to the 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 a ground stud should be worn to reduce the possibility of damage.

ACCESSORY USE

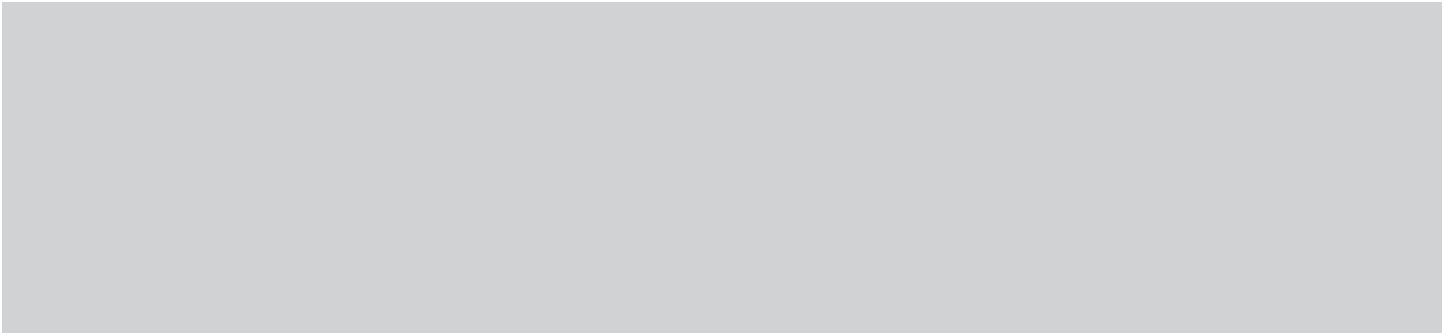
Using accessory devices not specified by DCI for use with their equipment may result in an increase of electromagnetic emissions and/or a decrease in electromagnetic immunity of the system.

INTERFERENCE FROM OTHER EQUIPMENT

If other equipment is used adjacent to or stacked with the DCI Edge equipment, the system must be observed to verify normal operation.

DCI EDGE EQUIPMENT COMPLIANCE

This equipment has been tested and found to comply with the limits for medical devices in IEC 60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. In the event of interference, power the devices from separate mains supplies and/or increase the physical distance between devices. Contact Customer Service if you have any questions.



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