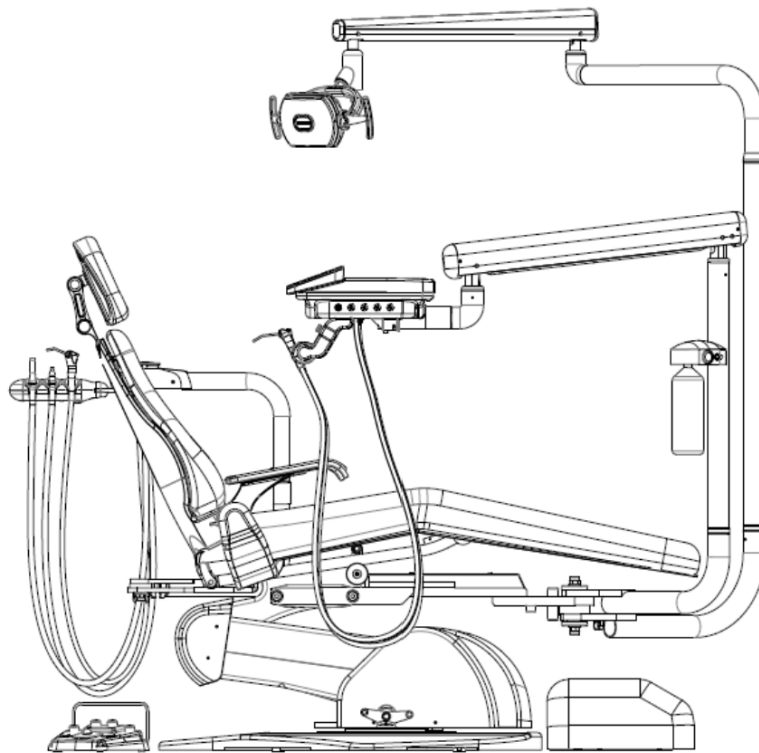


# FDC Pivot Mount Chair Dental Package

FDC – 37HC

User Manual



Firststar Dental Company

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## Introduction

Thank you for choosing Firststar Dental products. This booklet contains detailed information about the operation instruction and maintenance information for the FDC-37HC model.

To assure that services and operations are completed safely and correctly, please read this entire manual before performing any services or repairs on this unit. Please keep this booklet in a safe place for future reference.

## Safety Precautions

- Equipment operating environment shall match with the specified requirements.
- Make sure the supply air and water qualities are satisfied with the industry standard.
- Make sure this equipment is connected to a supply mains with protective earth.
- DO NOT place any heavy objects on the delivery system tray, lighting flex arm and assistant's elbow arms.
- DO NOT attempt to service or modify this unit without certified service technicians.
- Follow the maintenance schedule to properly service the unit.

## Definition of Symbols

The following symbols may be used throughout the product manual:



**Caution:** Failure to carefully follow the described procedure may result in damage to the equipment.



**Warning:** Failure to carefully follow the described procedure may result in damage to the equipment and the operator.



**Electric Shock Risk:** Risk of electrical shock present. Make sure power is disconnected before attempting this procedure.

## IEC Symbols

The following symbols conform to IEC labeling standards and may be located throughout the product:



AC (Alternating Current)



Protective earth (Ground)



Protected against splashing



Attention: Consult accompanying documents



Type B equipment  
(Protected against electrical shock)



Dangerous voltage



Refer to instruction manual / booklet



Manufacturer ID



Manufacturer Date



Waste Electrical and Electronic Equipment



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



Indicates conformity to General Requirements for Safety is certified by Intertek testing services

## Transportation and Storage Instructions

- Surrounding environment such as atmospheric pressure, temperature and relative humidity shall match with the manual specified requirements.
- Protect from moisture and rain during transportation and storage is required.
- Protect against impact, vibration and falling is required during transportation and storage.
- Transport and store the boxes upright.

- Storage location shall be well ventilated. Storage environment shall not contain any corrosive gases.

## Recommended Environment Conditions

### Transportation and Storage Environment

- Ambient Temperature: -29°C to +74°C
- Relative Humidity: 0% to 95%
- Atmospheric Pressure: 50KPa to 106KPa

### Operation Environment

- Ambient Temperature: +15°C to +27°C
- Relative Humidity: Conditioned Air
- Atmospheric Pressure: 50kPa to 105kPa

## Specifications

### Power Supply

- 115V, 50/60Hz, as applicable

### Air Pressure

- -551.6kPa (-80PSI) (at regulator in USC)

### Water Pressure

- -275.8kPa (-40PSI) (at regulator in USC)

## Classifications

ETL CLASSIFIED



Intertek  
4010684

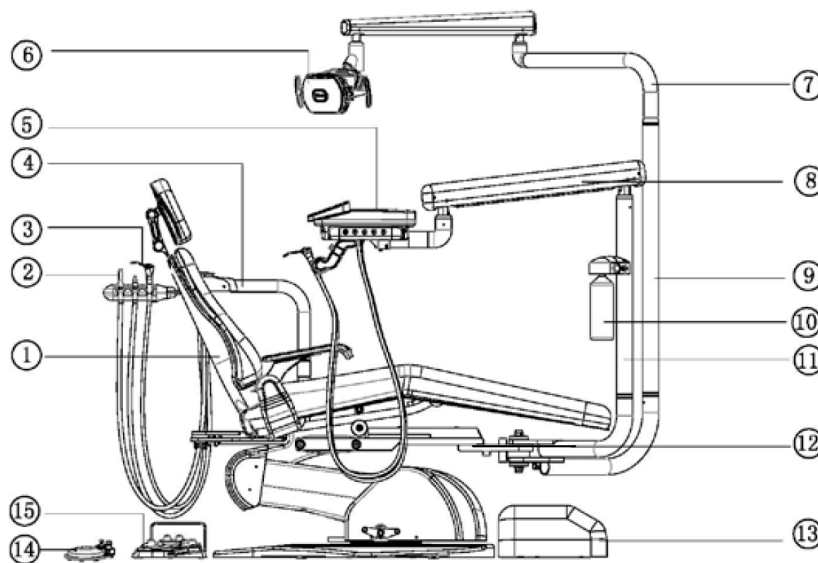


0120

Medical – General medical Equipment Certified as to electrical shock, fire and mechanical hazards only in accordance with:  
ANSI/AAMI ES 60601-1:2005 + C1;A2  
CSA std. C22.2#60601-1:2008 Ed.2+C2  
IEC 80601-2-60:2012 Ed. 1  
IEC 60601-1-2:2014

For the purposes of this manual, the ETL approval is for the unit, power supply and dental light. All other regulatory markings are provided on their respective manuals.

## Package Components



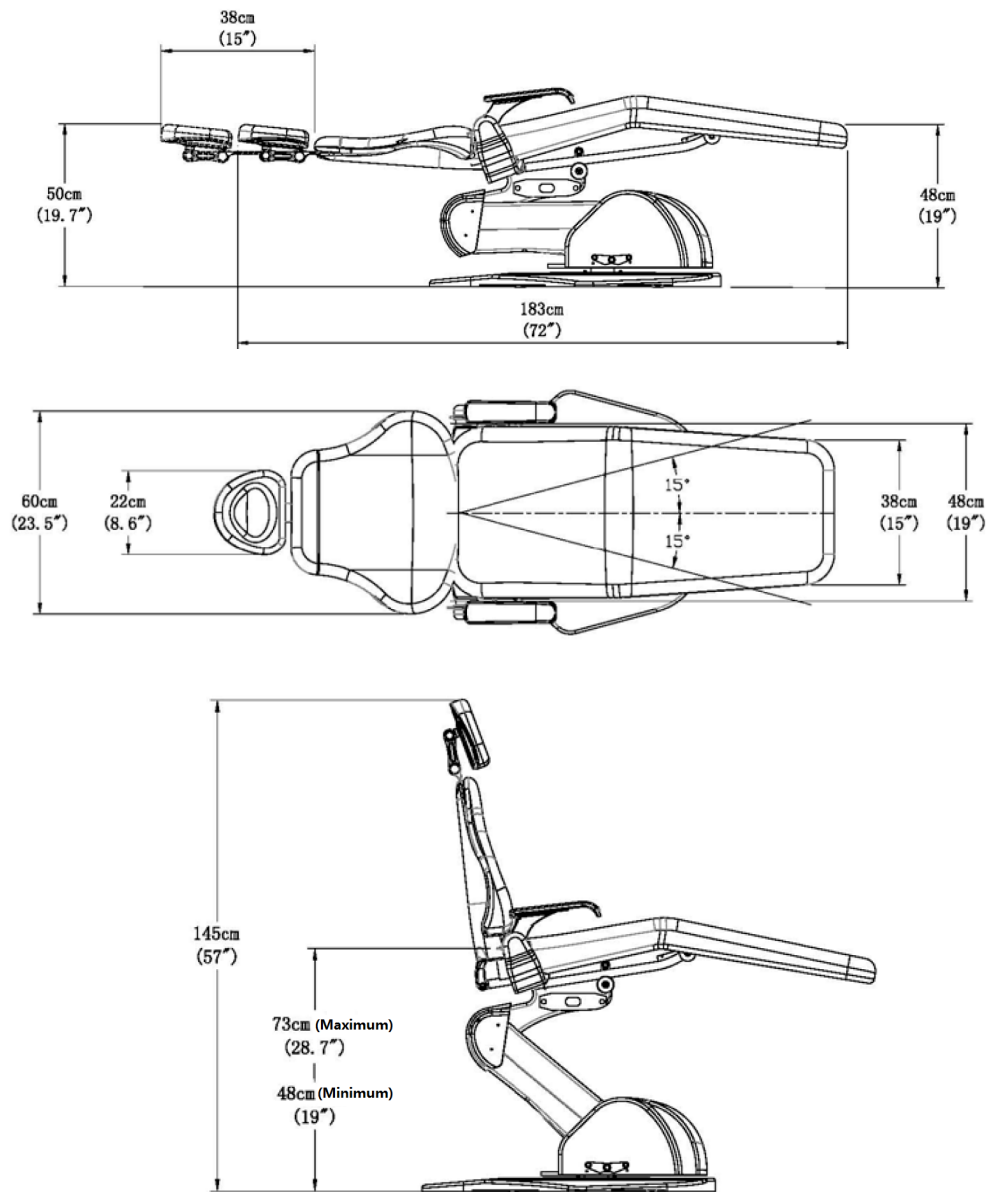
FDC-37HC Pivot Chair Mount Package

- ① Dental Chair
- ② HVE/SE
- ③ 3-Way Syringe
- ④ Assistant's System Flex Arm
- ⑤ Delivery System Tray
- ⑥ Dental Light
- ⑦ Dental Light Rotation Arm
- ⑧ Delivery System Flex Arm
- ⑨ Dental Light Post
- ⑩ Purified Water Bottle
- ⑪ Delivery System Post
- ⑫ Front Pivot Elbow
- ⑬ Contoured Utility Center
- ⑭ Delivery System Foot Switch
- ⑮ Chair Foot Switch

**Unit Dimensions and Technical Data**

**Dental Chair**

**A. Dimensions**

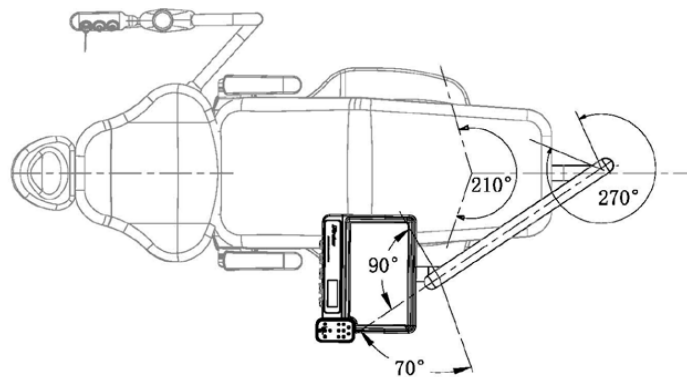
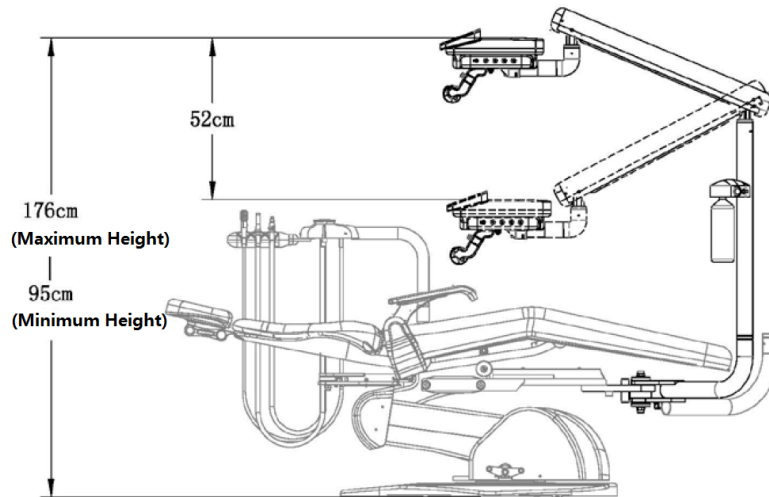


**B. Technical Data**

|                                |   |
|--------------------------------|---|
| Hydraulic Liquid Pressure:     | 5.6MPa (55 kgf/cm <sup>2</sup> )                  |
| Input Supply Power:            | 115 VAC, 60Hz / 230 VAC, 50Hz/60Hz, as applicable |
| Fuse Size:                     | F1/F2-10A, F3-100mA / F1/F2-6.3A, F3-63mA         |
| Maximum Load (including unit): | 2450N (250kgf)                                    |
| Control Voltage:               | 5VDC  |
| Modes of Operation:            | Intermittent: 25 sec ON – 300 sec OFF             |

## Delivery System

### A. Dimensions

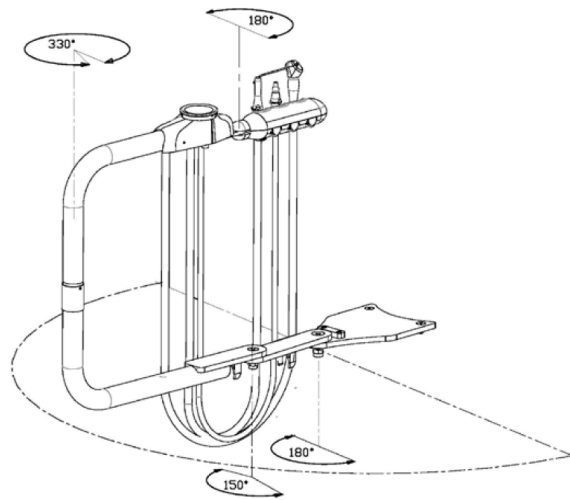


### B. Technical Data

|                              |                    |
|------------------------------|--------------------|
| Air Pressure Requirements:   | -551.6kPa (-80Psi) |
| Water Pressure Requirements: | -275.8kPa (-40Psi) |
| Maximum Load:                | 10 pounds          |

## Assistant's System

### A. Dimensions

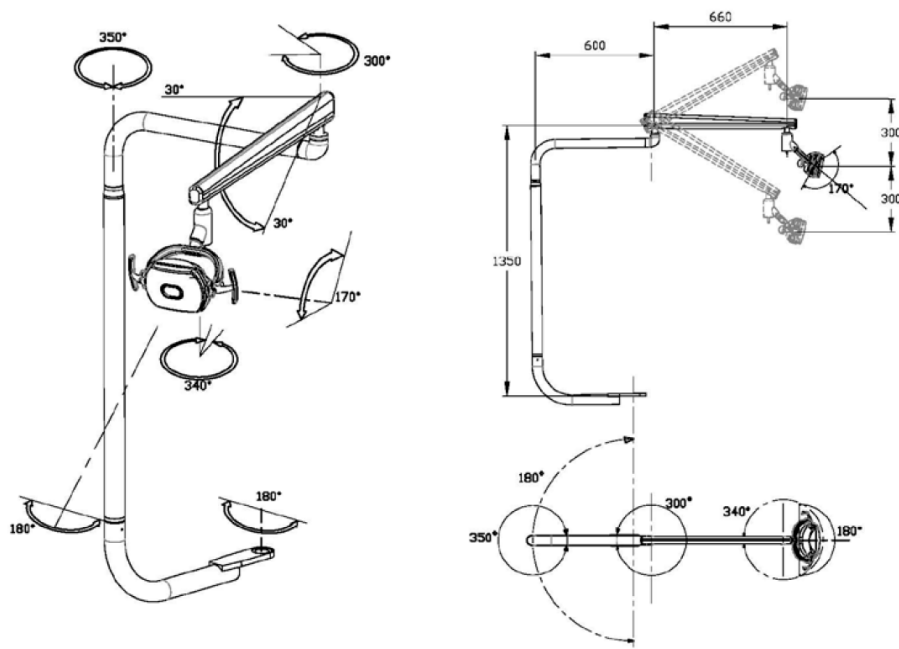


Maximum Load:

5 pounds

## Dental Light System

### A. Dimensions



### B. Technical Data

Supply Power:

AC 12V, 50/60 Hz

Power Consumption:

15 VA

Brightness Level:

8000Lx ~ 30000 Lx



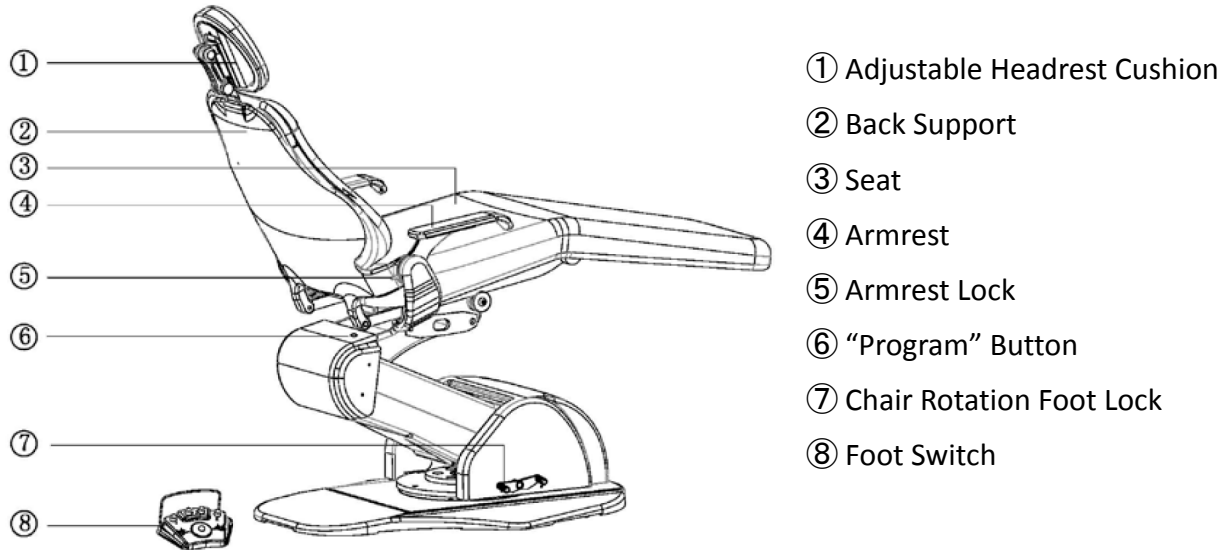
Color Temperature:

5,000 – 5,700K

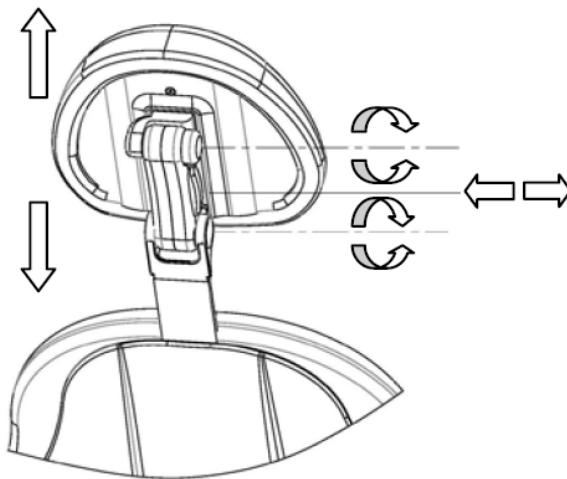
## Operation Instruction

### Dental Chair

### Dental Chair Components



### Headrest Position Adjustment



#### Double Articulating Headrest

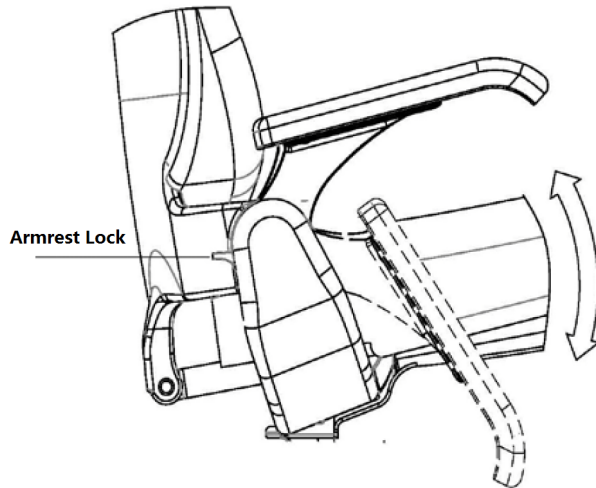
##### **Height Adjustment**

Push down or pull up the blade from the chair back to change the headrest to the desired height.

##### **Angle Adjustment**

Angle of headrest can be changed by grasping the headrest release lever on headrest release mechanism. Release the mechanism to lock

## Armrest Adjustment



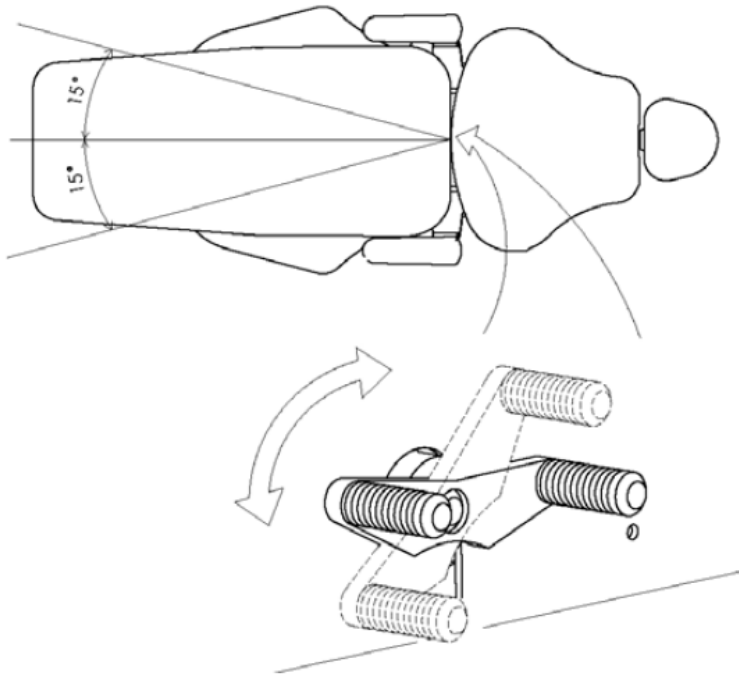
the headrest at the desired position.

The chair's armrest can be lowered allowing patient to enter and exit from either side of the chair.

To lower and raise the armrest:

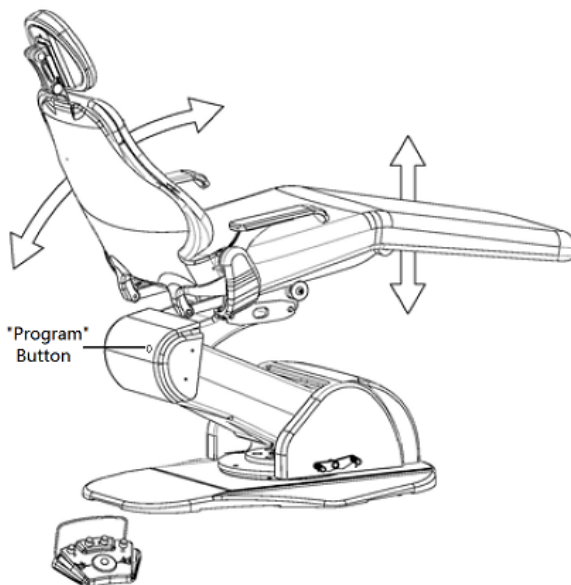
- Pull up the armrest lock trigger, push the end of the armrest to lower it.
- Lift up the arm till you hear a click sound, which secures the arm in its original up position.

## Chair Rotation Adjustment (Optional Upgraded Feature)



Release the chair rotation foot lock by stepping on it counterclockwise. The chair can rotate approximately 15° to either side of its center position. To secure the final position, simply lift up the leg to engage the foot lock again.

## Dental Chair Foot Switch Settings



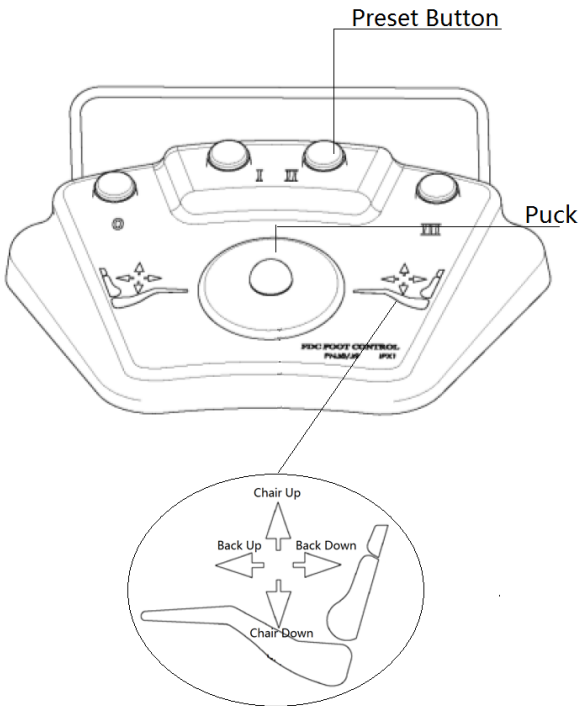
Manual positioning of the chair can be done by operating the footswitch or touchpad control located at the delivery system tray.

### Chair & Back Up or Down Operation

- To move the chair up or down, push and hold the puck on the foot control (Up and down buttons)
- To move the back up and down, push and hold the puck on the foot control (Left and right buttons)

### Programming the Position Preset Buttons

1. Using the menu control puck, follow the direction of the arrow to control the chair.
2. Push and hold the “Program” button located at the back of the chair until a beeping sound is heard.



3. Push any preset button to assign it to this position. The chair will beep three times to indicate the program is complete.
4. Program failure is indicated by more than three beeps.

### Activating Auto Positions

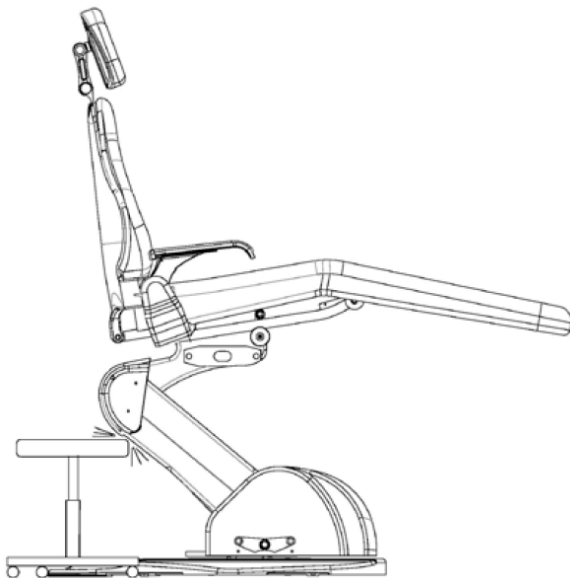
1. Push any preset buttons on the footswitch or touchpad.
2. A beep sound will be heard.
3. The chair will automatically move to the preset position.

Hints: Any preset button can only be assigned with one position. Reprogramming a new auto position will erase the old position.



Before operating the chair, observe and confirm safety for the patient and the operator.

### Dental Chair Collision Protection System



To prevent damage to the chair or other equipment, all FDC dental chairs are equipped with a Collision Protection System.

The safety switch located at the bottom of the chair senses the chair contacts an object when the chair is moving down; the *Chair Down* function will be disabled and motion of the base stops immediately. The chair will automatically run up a little before it stops.

Move the object away and move the base up will deactivate the safety switch and the chair can operate normally again.

Note:

When the safety switch is activated, the *Chair Down* function is disabled. The chair down button and the auto position buttons will no longer work.



Extensive long use of the chair movement will result in overheating of the hydraulic motor and shorten its life span. Make sure to follow the dental chair duty cycle: 25 sec ON – 300 sec OFF



Even with collision protection, chair can be damage with continuous contact. Keep objects away from chair to ensure proper unit operation.



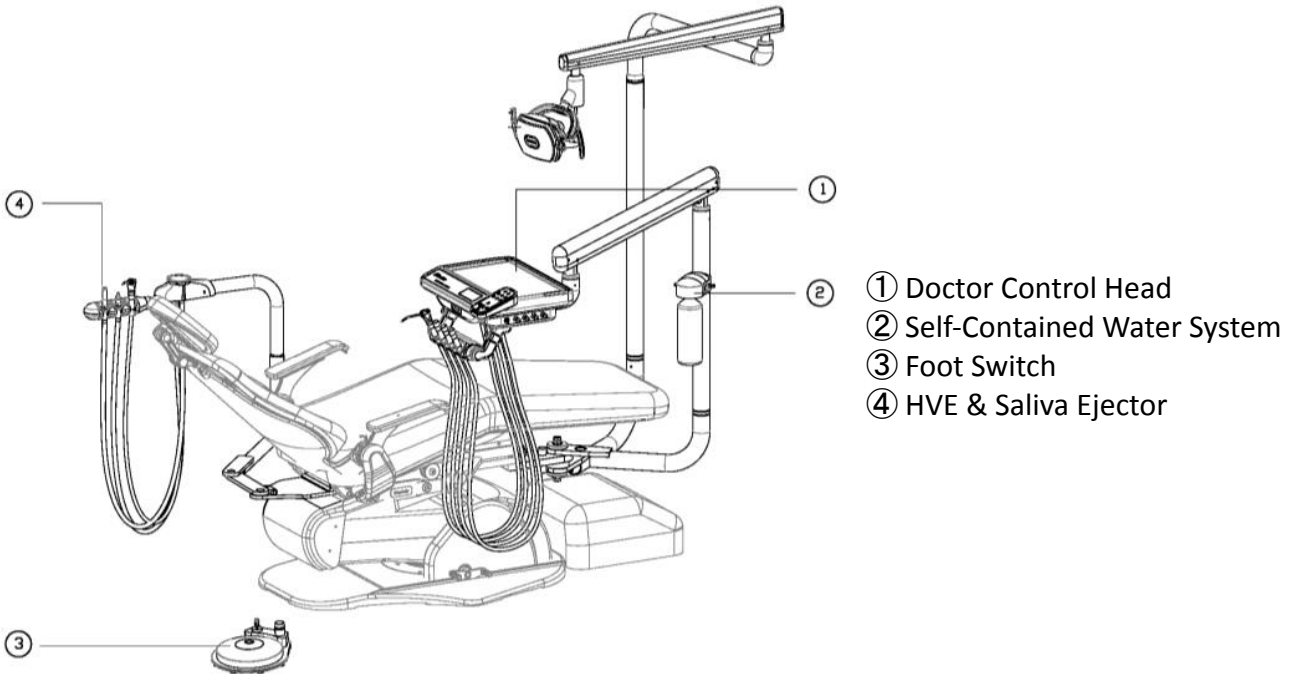
Do not energize the unit until all shipping secured materials have been properly removed.

## Dental Unit



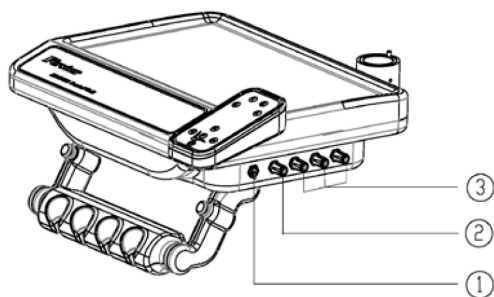
Please read through the following section carefully. Make sure to understand the operation of the dental unit thoroughly to avoid mistakes in unit operation during patient treatments.

The dental unit mainly consist of delivery system, assistant's system and the contoured utility center.

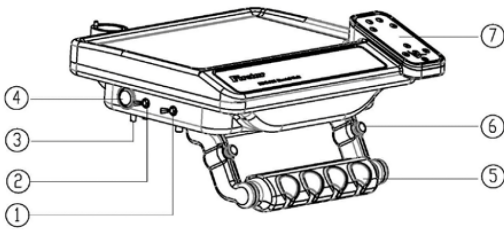


## Doctor Control Head

The control head allows operators to put surgical equipment on top of the tray and it provides controls for water pressure, air pressure and electrical power.



Each volume flow control knob controls volume flow for the associated handpiece. The volume flow knob can be adjusted by the doctor at any time as needed



① Tap Water / Purified Water Source Selection Switch. It switches to different water sources.

② Master ON/OFF Switch. It controls the air and water supply to the delivery system. Whenever the unit is not in operation, it is recommended to turn the switch to OFF position to ensure better operation of the air and water control circuit in a long run.

③ Air Pressure Setting (Hp1/Hp2/Hp3). This setting provides air pressure adjustment for each handpiece. The pressure setting dials are labeled as HP1, HP2 and HP3. The pressure setting adjustment shall only be done during the startup process. Once the pressure is adjusted to the correct setting, there is no need to adjust it in the future unless the air compressor machine is replaced with different pressure settings.

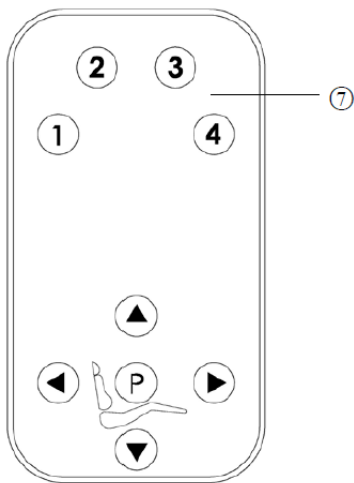
④ Air Pressure Gauge. It provides accurate reading of the required air pressure for the handpieces.

⑤ Automatic Handpiece Holder. The water and air pressure system will automatically turn on for a handpiece whenever that handpiece is taken out from the automatic handpiece holder.

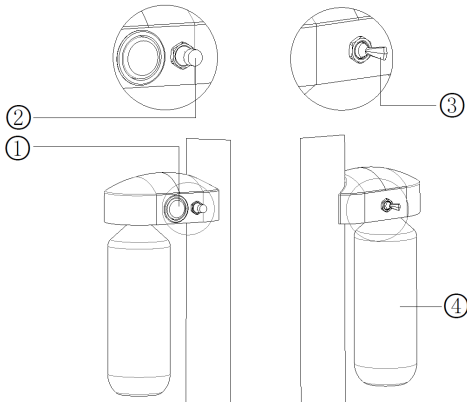
⑥ Delivery System Tray Position Lock Switch. This switch position is normally closed. It normally locks out the tray angle and height adjustment. Whenever this switch is in opened position, the tray can be relocate to different positions. Please do not try to relocate the tray position without turning on the lock switch to ensure auto-locking feature to function properly.

⑦ Touchpad Operation. Similar to the foot control operation. Preset buttons ① ~ ④ are for auto-positions.

Buttons ▲ ▼ ◀ ▶ are for Chair Up, Chair Down, Back Up, Back Down. is the “Program” button to assign different positions to any of the preset buttons.



### Self-Contained Water System



- ① Water Bottle Air Pressure Gauge
- ② Water Bottle Air Pressure Adjustment Valve  
Turn The Dial Clockwise To Release Pressure.  
Turn The Dial Counterclockwise To Add Pressure.
- ③ Water Bottle Air Pressure On/Off Switch
- ④ Purified Water Bottle

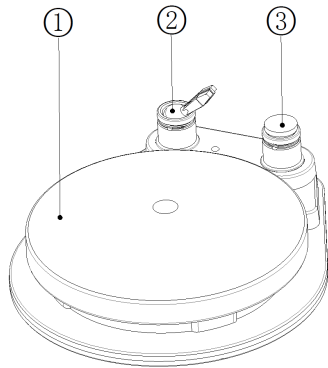


Please make sure that the supply air pressure does not exceed the maximum operating pressure at 40 psi.



Make sure that water bottle air pressure ON/OFF switch is changed to the OFF position before the water bottle is removed.

### Delivery System Foot Control



- ① Speed Control Disc  
The speed of the handpiece is controlled by the speed control disc. A light pressure on the disc causes a slow speed and a full pressure causes full handpiece speed.
- ② Wet/Dry Toggle Switch (optional feature)  
Optional Wet/Dry toggle switch allows air and coolant selection via foot control.
- ③ Chipblower (optional feature)  
Optional chipblower allows to blow debris away by creating an air blast without causing the bur to rotate.



Supply water must be processed with filtration and purification. Also, make sure the interior tubing is clear from any blockages to allow proper unit operation.



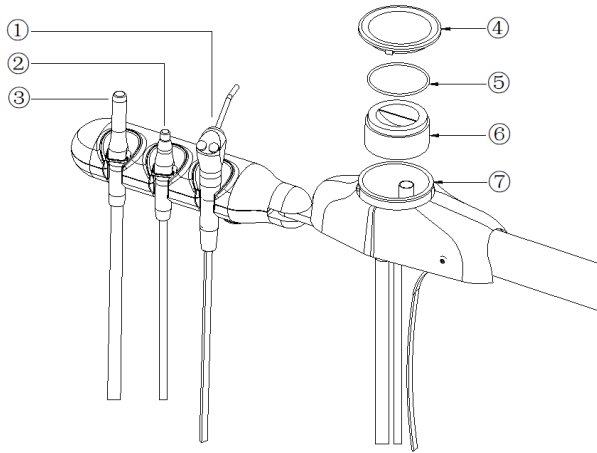
Supply air must be processed with filtration and purification to satisfy with dental standards. Failure of keeping the supply air clean might affect patient's health and the quality of the dental treatment. Also, it might affect the life cycle of the unit.



Make sure to turn off the master ON/OFF switch after daily operation. Turning off the master switch will disable the water and air supply to avoid unnecessary potential damages of the system.

### Assistant's Instrumentation

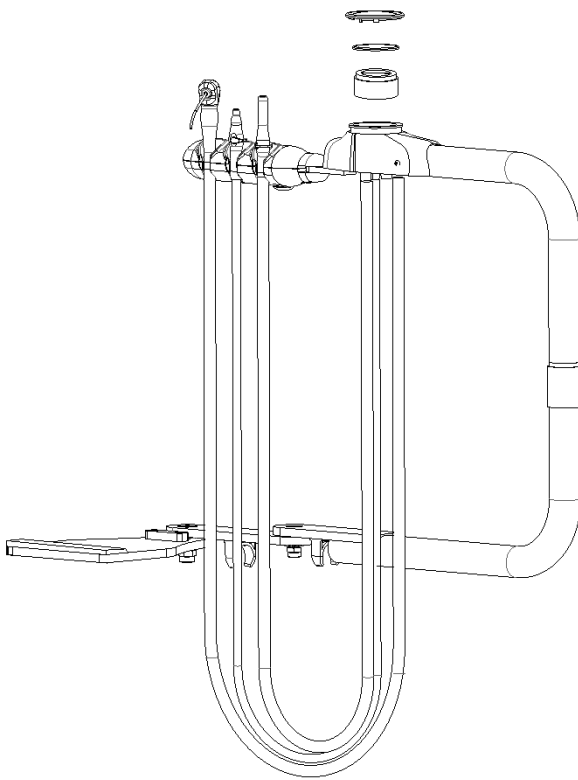




Detail View

- ① High-Volume Evacuator (HVE)
- ② Saliva Ejector (SE)
- ③ 3-Way Air/Water Syringe
- ④ Vacuum Canister Top Cover
- ⑤ Vacuum Canister O-Ring
- ⑥ Solid Collector
- ⑦ Vacuum Canister

The standard assistant's instrumentation includes one HVE, one SE and a three-way air/water syringe.



Full View

Typically, the O-ring is attached to the vacuum canister top cover. The purpose of the O-ring is to allow a better seal between the top cover and the vacuum canister. Suggest to monitor the condition of the O-ring periodically. Replace it if needed to avoid air leakage.

The purpose of the solid collector is to filter out any solid or dirt that might potentially clog the vacuum pipe and cause problems for the central vacuum system.

Pay strict attention to the vacuum pressure from the HVE and SE during the operation. The weak vacuum pressure often comes from the results of clogged solid collector. Clean the solid collector periodically. Replace the solid collector to a new one if needed to ensure the vacuum system clean and functional.

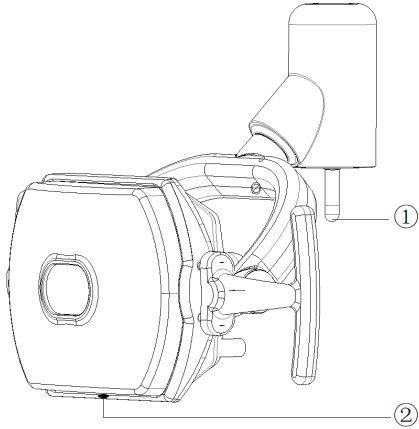


Do not place any object besides the standard assistant's instrumentation on the assistant's arm.



Please clean or replace the solid collector periodically. Refer to the recommended maintenance schedule for more information.

### Dental Light System



There are two joint connections to allow better angle/location adjustments of the dental light. The dental light can be adjusted to the ideal location during operation. The dental light is equipped with proximity switch for ON/OFF control and brightness level adjustment.

① Dental Light Master Electrical Power Switch.

② Proximity Switch.

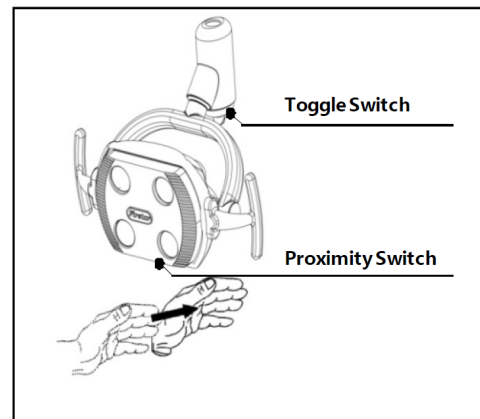
### Operations

1. Switching the operating light ON with current light status OFF

- Move your hand past and underneath the proximity switch.

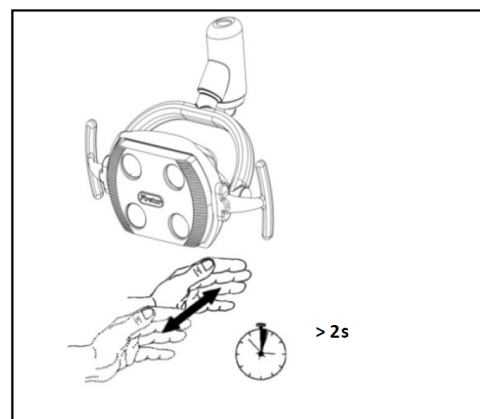
2. Switching the operating light OFF with current light status ON

- Move your hand past and underneath the proximity switch.



3. Adjusting the brightness

- Hold your hand underneath the proximity switch for at least 2 seconds, the light will not flash.
- When the strongest or the weakness brightness has been reached, the light will briefly flash once to remind you.
- As soon as the desired brightness has been reached, the light will flash once again which means the brightness has been set up. This indicates that you have left the programming mode.



Due to the extreme brightness of the LED technology employed, directing the light beam into the patient's or user's eyes should be avoided! Briefly looking into the light beam is harmless.

## **Equipment Maintenance Schedule**

### **Before Each Patient**

1. Check dental chair movement, make sure the control features function normally.
2. Check for water and air leakage.
3. Check for proper water flow, air flow, air turbine revolution, micromotor revolution and scaler vibration.

### **After Each Patient**

1. Clean, lubricate and sterilize handpieces.
2. Clean and sterilize syringe tips.
3. Wipe down and flush handpiece tubing.
4. Flush suction vacuum line and clean the filter of the vacuum or saliva ejector handpiece.
5. Clean the solid collection inside of vacuum canister.
6. Clean/disinfect touch and transfer surfaces.
7. Turn off the product main switch and close the water/air main valves.

### **Daily**

1. Flush vacuum lines with at least two cups of water to eliminate the blockage inside of the lines.
2. Refill the purified water bottle as needed.

### **Weekly**

1. Clean chair upholstery by following the cleaning instructions.
2. Clean HVE and saliva ejector valves
3. Clean dental light shield with soft towel and clean water. The light shield can be removed from the assembly before cleaning. Make sure the shield is clean and dry without any water marks.
4. Check for abnormal noise from product's moving parts.



Disconnect electrical power before cleaning the dental light with wet towel. Failure to heed this warning may result in electric shock. Do not use wet towel for light bulb, avoid direct contact to light bulb with bare hands as it might leave marks on the light bulb that will decrease the brightness level.

## **Monthly**

1. Inspect all handpiece, motor and O-rings. Replace if worn or damaged.
2. Inspect HVE and saliva ejector O-rings. Replace if worn or damaged.
3. Check the water pressure and air pressure by reading pressure gauges.
4. Delivery system tray shall be balanced and free of inclination. Rebalance if needed.

## **Yearly**

1. Inspect supply water filter in the Contoured Utility Center. Clean or replace the filter as needed.
2. Inspect supply air filter in the Contoured Utility Center. Clean or replace the filter as needed.

Note: This is only the manufacture recommended maintenance schedule. Actual maintenance schedule might be more frequent due to different operating conditions.



Whenever there is a part failure or any abnormal operational behavior from the unit such as loose screws and abnormal noises, users shall contact the certified service technician immediately to avoid further problems.

## **Dental Chair Upholstery Cleaning Instructions**

1. Combine 10% of household dish washing liquid with 90% of the warm water.
2. Clean the surface gently with a sponge or soft damp cloth by applying the mixed solution.
3. Clean the surface with soft wet cloth by applying clean water.
4. Clean the residue and dry the surface with a dry soft cloth.
5. Make sure the surface does not have soapy film forming on top after it gets dry.

Hints: for extremely bad stains, it is okay to clean the surface with alcohol. Wet the soft towel with alcohol and gently clean the surface of upholstery.

The leather upholstery are made of stain resistant and antimicrobial materials. For deep cleaning and sterilization, it's okay to use household bleach or alcohol.



Improper cleaning and disinfection methods could lead to cross-contamination. Therefore, it is important to follow the cleaning instruction before each patient's dental procedure.



It is important to pay strict attention to the cleaning product manufacturer's instructions. Some cleaning products may contain harsh solvents that could damage the upholstery leather in the long run.

## Electromagnetic Compatibility

All electrical medical devices are subject to special EMC safety measurements and as a result the equipment must be installed and operate according to the installation instruction manual and the user manual.

Portable and mobile RF communications equipment can affect medical electrical equipment.

ELECTROMAGNETIC COMPATIBILITY testing has been done for this product. All test results and electromagnetic environment guidance are shown below.


### Emissions Test

| Emissions TEST  | COMPLIANCE LEVEL   | TEST DATA   | ELECTROMAGNETIC ENVIRONMENT GUIDANCE  |
|---|--|---|---|
| RF emission<br>(CISPR 11)<br>Group 1 Compliance<br>Class B Compliance | Limit at 3m [dB( $\mu$ V/m)]<br>200MHz 30 [dB( $\mu$ V/m)]<br>400MHz 37 [dB( $\mu$ V/m)]<br>800MHz 37 [dB( $\mu$ V/m)] | Limit at 3m [dB( $\mu$ V/m)]<br>200MHz <20 [dB( $\mu$ V/m)]<br>400MHz <27 [dB( $\mu$ V/m)]<br>800MHz <27 [dB( $\mu$ V/m)]     | This product has very low radiated emission and it is not likely to cause any interference in nearby electronic equipment.  |
| Harmonic emissions<br>(IEC 61000-3-2)<br>Class A Compliance           | Max harmonic does not exceed 100% limit.   | Worst harmonic was #5 with 6.66% of the limit.  | This product is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes. |
| Flicker emissions<br>(IEC 61000-3-3)                                  | Highest dt (%): <3.3<br>Time (mS) >dt: 500<br>Highest dc (%): <3.3<br>Highest dmax (%): <7<br>Highest Pst (10 min): <1 | Highest dt (%): = 1<br>Time (mS) >dt: = 0<br>Highest dc (%): = 0.34<br>Highest dmax (%): = 1<br>Highest Pst (10 min): = 0.415 |   |

## Immunity Test

This product is intended for use in the following electromagnetic environment. Users should assure that the product is used in such an environment.

| IMMUNITY TEST  | IEC COMPLIANCE LEVEL  | IEC60601 TEST DATA  | ELECTROMAGNETIC ENVIRONMENT GUIDANCE   |
|--|---|---|--|
| Electrostatic Discharge (ESD) immunity<br>IEC 61000-4-2                        | $\pm 2, \pm 4, \pm 6$ kV direct contact discharge<br>$\pm 2, \pm 4, \pm 8$ kV direct air discharge                | $\pm 2, \pm 4, \pm 6$ kV direct contact discharge<br>$\pm 2, \pm 4, \pm 8$ kV direct air discharge                | Floors should be wood, concrete or ceramic tile. Maintain at least 30% room humidity if the floors are covered with synthetic material.                            |
| Electrical Fast Transient/Burst (EFT) immunity<br>IEC 61000-4-4                | $\pm 2$ kV for a.c. and d.c. power lines @ 5kHz repetition frequency  | $\pm 2$ kV for a.c. and d.c. power lines @ 5kHz repetition frequency  | Main supply power should be that of a typical commercial or hospital environment.  |
| Surge immunity<br>IEC 61000-4-5  | $\pm 0.5$ kV, $\pm 1$ kV a.c. power line to line<br>$\pm 0.5$ kV, $\pm 1$ kV, $\pm 2$ kV a.c. power line to earth | $\pm 0.5$ kV, $\pm 1$ kV a.c. power line to line<br>$\pm 0.5$ kV, $\pm 1$ kV, $\pm 2$ kV a.c. power line to earth | Main supply power should be that of a typical commercial or hospital environment.  |
| Conducted disturbance immunity<br>IEC 61000-4-6                                | 3V<br>0.15MHz-80MHz<br>6V in ISM and amateur radio bands between 0.15MHz and 80MHz<br>80% AM at 1kHz              | 3V<br>0.15MHz-80MHz<br>6V in ISM and amateur radio bands between 0.15MHz and 80MHz<br>80% AM at 1kHz              | Main supply power should be that of a typical commercial or hospital environment.  |
| Voltage dips and interruptions immunity<br>IEC 61000-4-11                      | 0% $U_T = 0.5$ cycle<br>40% $U_T = 5$ cycle<br>70% $U_T = 25$ cycle   | 0% $U_T = 0.5$ cycle<br>40% $U_T = 5$ cycle<br>70% $U_T = 25$ cycle   | Main supply power should be that of a typical commercial or hospital environment. It is recommended to power the product by an uninterruptable power system (UPS). |
| Power frequency magnetic field immunity<br>IEC 61000-4-8                       | 50Hz X,Y,Z orientations of induction coil:<br>3A/m  | 50Hz X,Y,Z orientations of induction coil:<br>3A/m  | Power frequency magnetic fields should be at levels characteristic of a typical commercial or hospital environment level.  |
| Note: a. $U_T$ is the AC mains voltage prior to application of the test level. |   |   |  |

| IMMUNITY TEST                 | IEC 60601 TEST LEVEL        | COMPLIANCE LEVEL | ELECTROMAGNETIC ENVIRONMENT GUIDANCE  |
|-------------------------------|-----------------------------|------------------|---|
| Conducted RF<br>IEC 61000-4-6 | 3 Vrms<br>150 kHz to 80 MHz | 3 Vrms           | $d = 1.2\sqrt{p}$   |
| Radiated RF<br>IEC 61000-4-3  | 3 V/m<br>80 kHz to 2.5 MHz  | 3 V/m            | $d = 1.2\sqrt{p}$ 80MHz 800MHz<br>$d = 2.3\sqrt{p}$ 800MHz 2.5 GHz<br>Where p is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).<br>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, (a) should be less than the compliance level in each frequency range. (b).<br>Interference may occur in the vicinity of equipment marked with the following symbol.<br> |

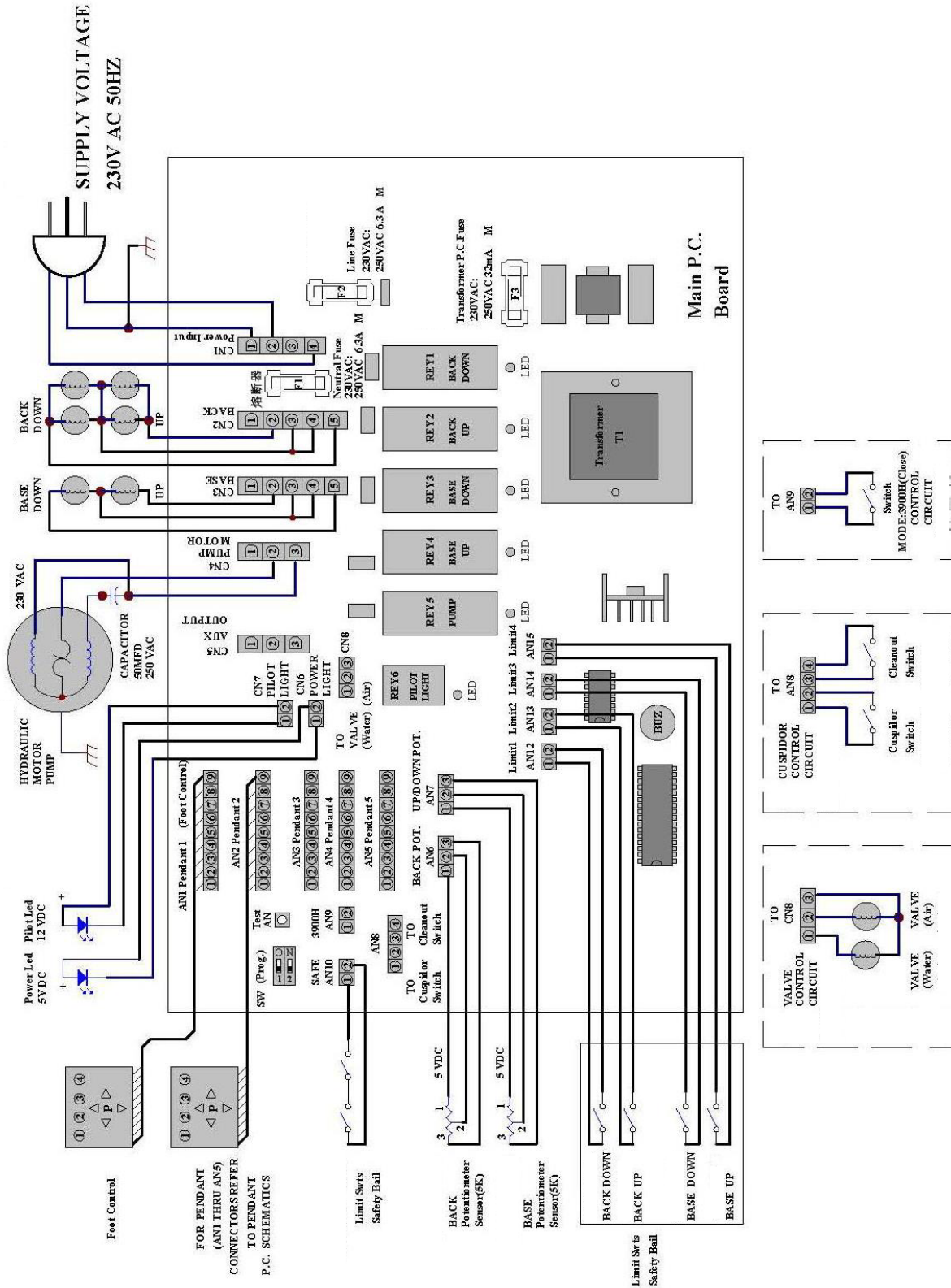
Portable and mobile RF communications equipment should be used no closer to any part of this unit, including cables, than the recommended separation distance calculated from the equation applications to the frequency of the transmitter.

NOTE 1: At 80 MHz and 800MHz, the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by adsorption and reflection from structures, objects and people.

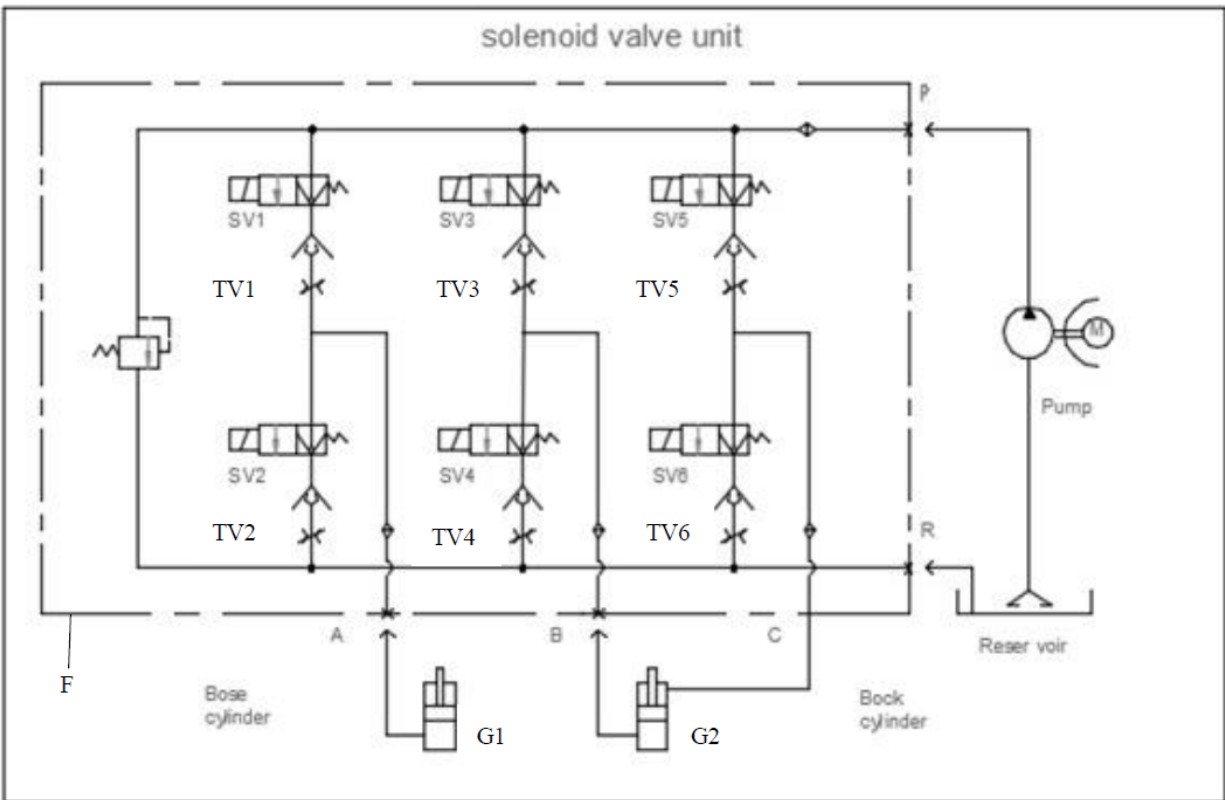
- a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which this unit is used exceeds the applicable RF compliance level above, this unit should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating this unit.
- b. Over the frequency range 150 KHz to 80 MHz, field strengths should be less than 3 V/m.

# Appendix Wiring Diagram





## Hydraulic Fluid Power Schematics



Pump: single phase AC hydraulic motor pump

F: six in one solenoid valve

P, A, B, C, R: solenoid valve fittings

G1: base movement cylinder

G2: back movement cylinder

SV1: base up solenoid (fluid supply)

SV2: base down solenoid (fluid return)

SV3: back down solenoid (fluid supply)

SV4: back down solenoid (fluid return)

SV5: back up solenoid (fluid supply)

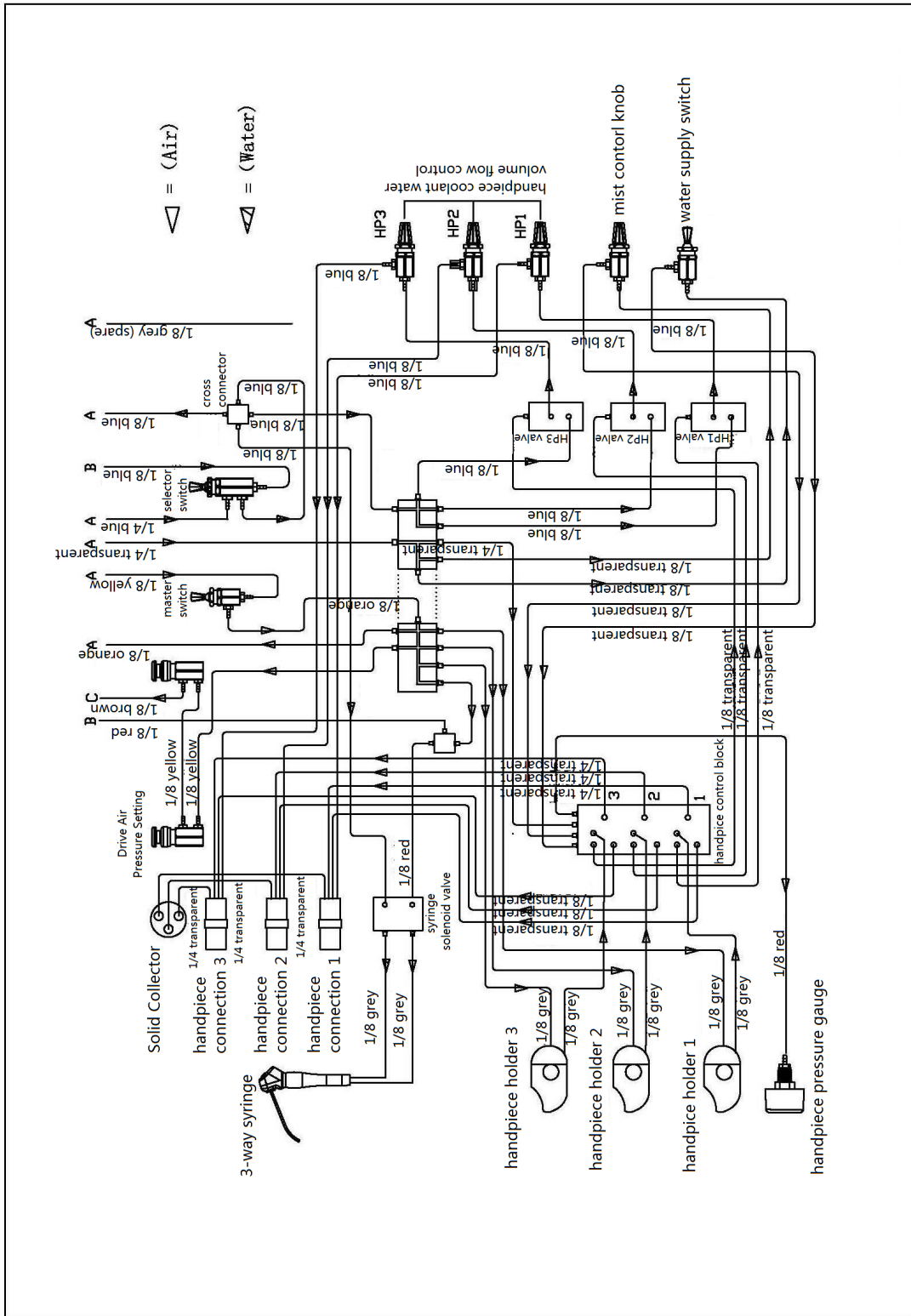
SV6: back up solenoid (fluid return)

TV1, TV2, TV3, TV4, TV5, TV6:

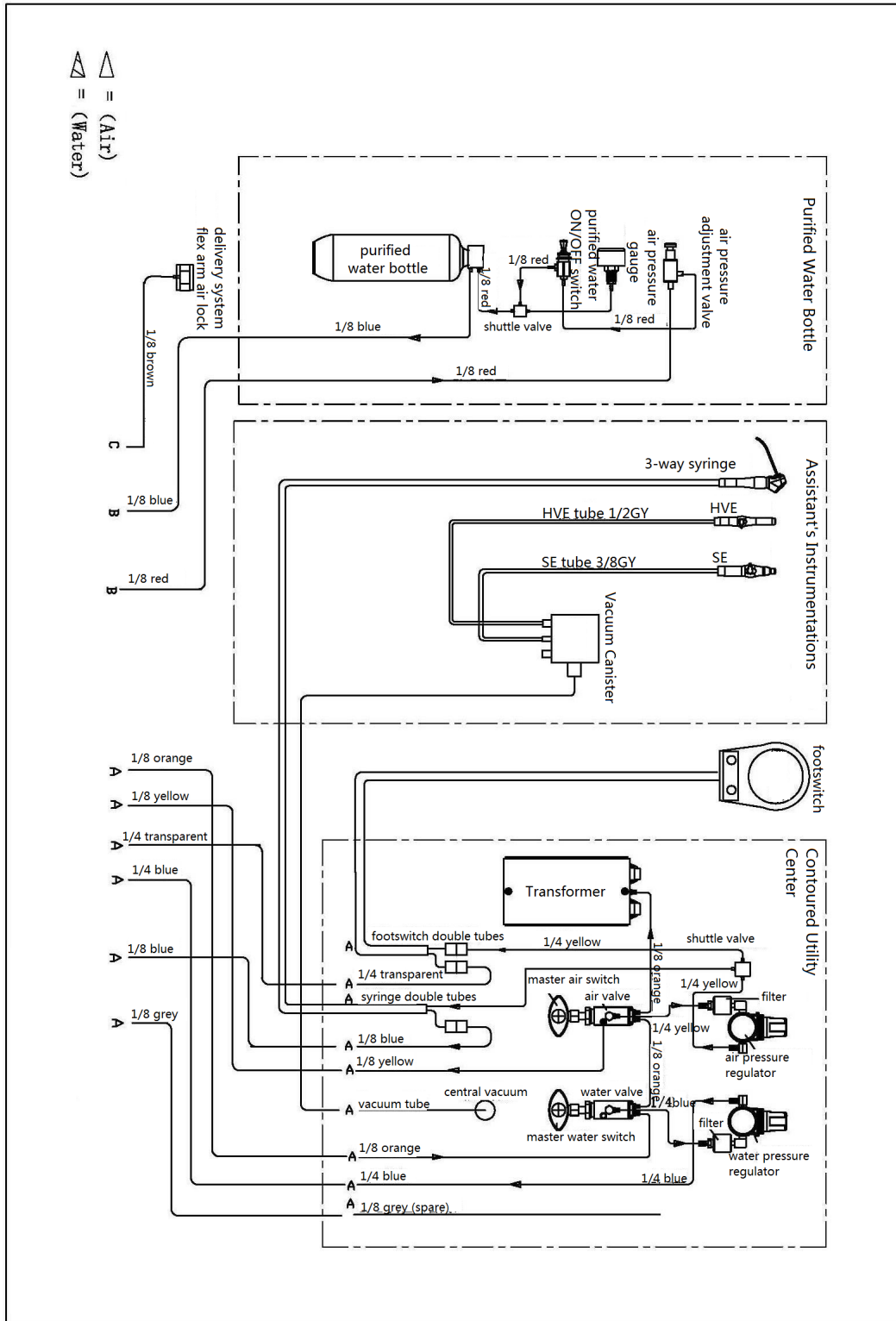
adjustable throttle

Reservoir: hydraulic reservoir

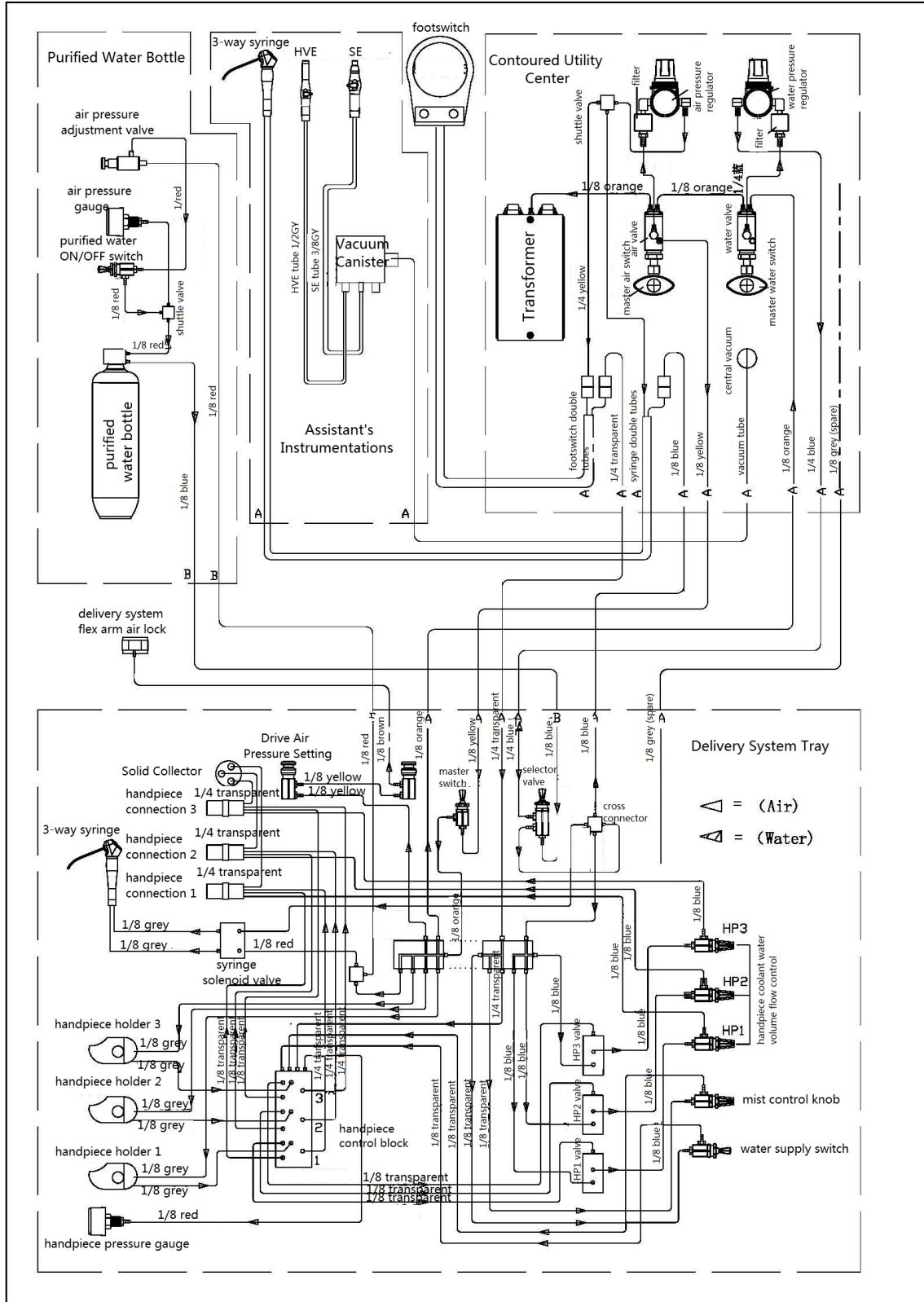
# Delivery System Tray Tubing Diagram



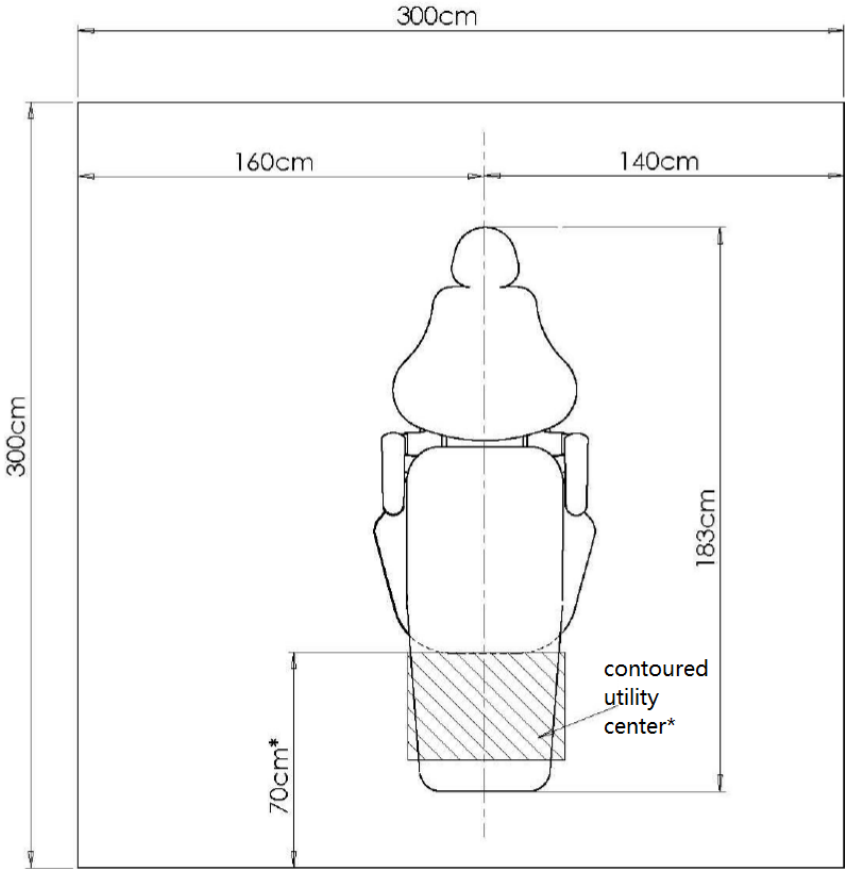
# Contoured Utility Center, Assistant's System and Water Bottle Tubing Diagram



# Dental Unit Overall Tubing Diagram



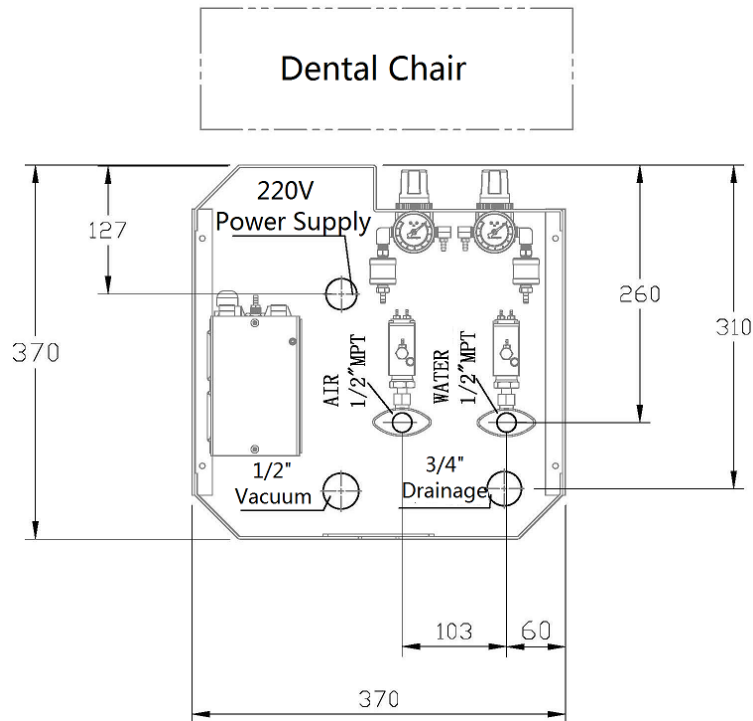
**Dental Chair Required Operating Area**



**Note:**

- 1. \*contoured utility center size and tubing diagrams are shown on the next appendix.
- 2. \*dental chair front clearance space is required to have at least 70cm away from the wall.
- 3. Each dental chair required operating area is 9 m<sup>2</sup>.

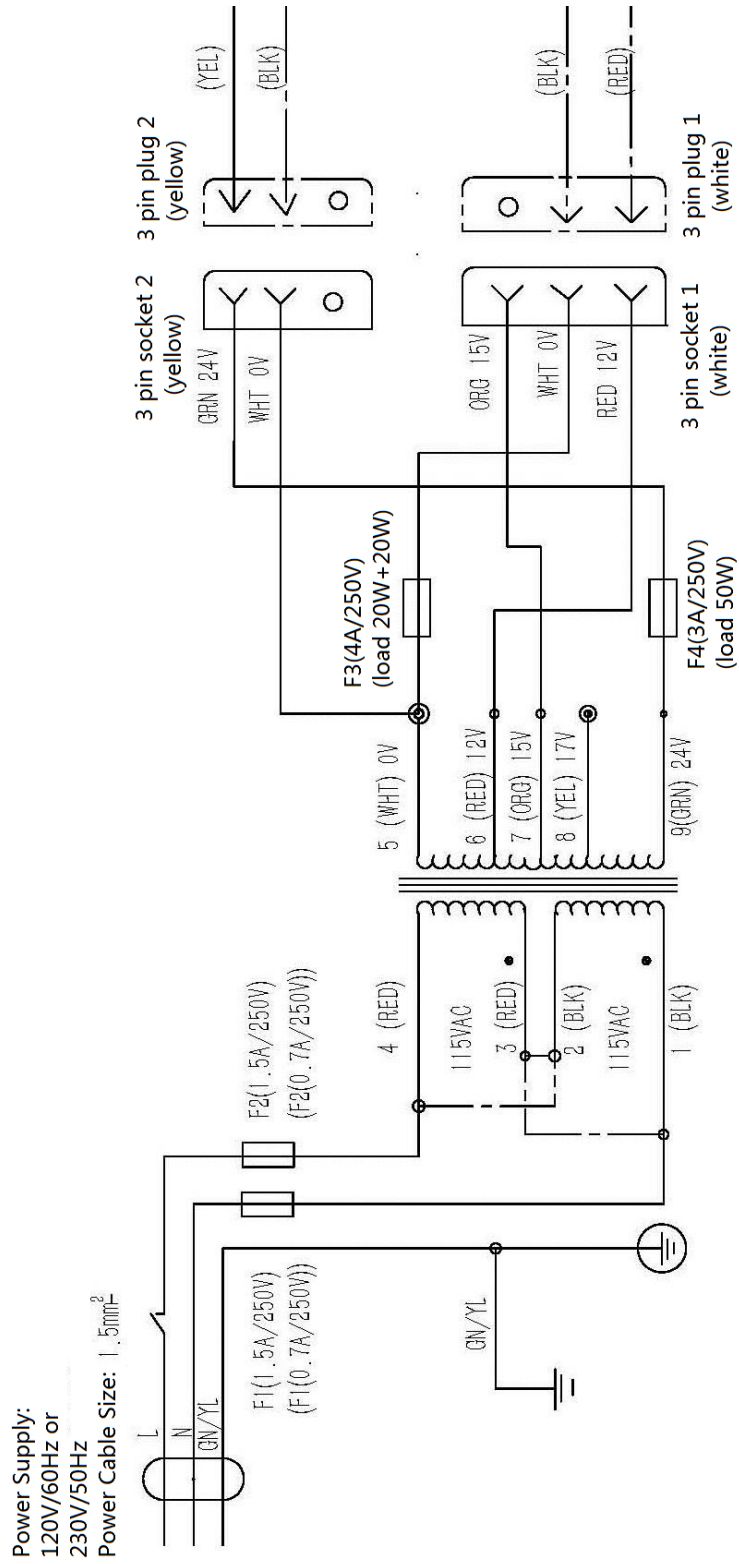
## Contoured Utility Center Detail



### Note:

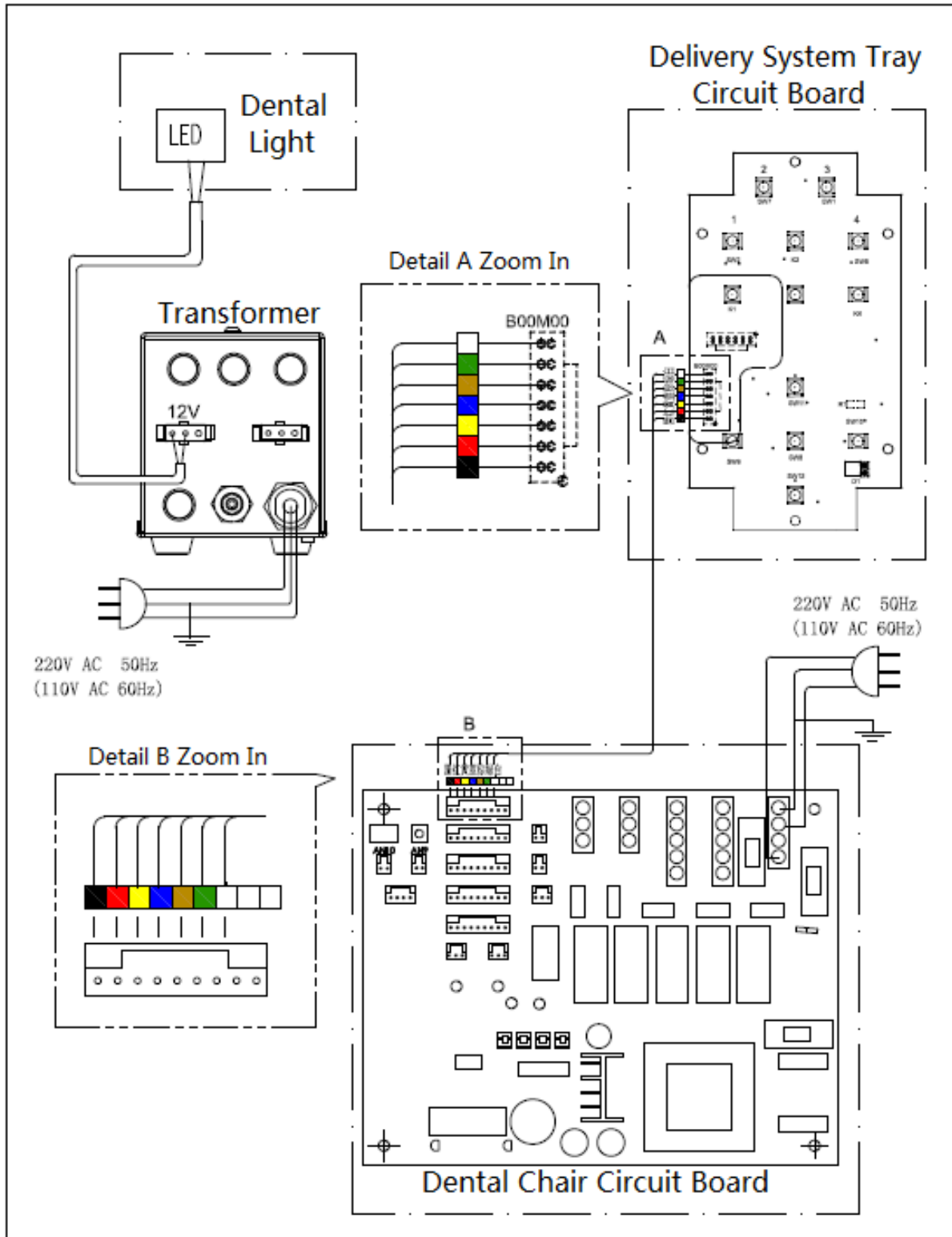
1. Air supply pipe, water supply pipe and central vacuum pipe are in 1/2" diameter size. They are all extending 30mm above the ground level.
2. Drainage pipe has diameter size 1.5" to 2". It is extending 30mm above the ground level.
3. Supply power is 220V. There is an overcurrent protection system provided for each dental chair. It is the best to install the overcurrent protection system at the left hand side of the chair. The overcurrent protection system and the wall outlet shall be at least 40cm above the ground level. Any wiring cables underneath the ground level shall all be protected with electrical conduit, conduit shall be extending 30-40mm above the ground level.

# Voltage Transformer Wiring Diagram



Note: Refer to the above diagram, connect 120V or 230V power supply cable accordingly.  
120V F1, F2 requires fuse size 1.5A/250V  
230V F1, F2 requires fuse size 0.7A/250V

# Circuit Board Schematics





## Warranty Statement

All FDC products sold to and installed by dealers are guaranteed to be free from defects in workmanship and materials for one year from date of purchase. Hydraulic motor pump itself has factory warranty of five years. During that period, FDC will replace any defective part at no charge. FDC WILL NOT be responsible for dealer or service company labor charges or shipping charges.

This guarantee does not cover normal wear, stains, cuts or scratches of upholstery or surface finishes or parts sold to OEM customers.

Staining, discoloration or deterioration of the equipment caused by disinfectant solutions is not covered under the warranty.

FDC will pay the return freight charges from the factory to the dealer. This guarantee does not cover damage resulting from improper installation, misuse or accidents incurred in shipping and handling.

All claims against the freight carrier must be initiated at the time the damaged items are received. The claim is the responsibility of the customer.

We are constantly striving to improve our products. We reserve the right to make modifications without the need for prior notification and are not obliged to modify previously manufactured items.

Accessories such as high/low speed handpieces, 3-way syringe, HVE & SE, scaler and other frequent maintenance items such as axel and rubber seals are not covered in this warranty.

Warranty period begins as soon as installation is done and accepted by the end user. Please contact your local dealers for more information on the product warranty.

**Caution:** only authorized service technicians should attempt to service FDC equipment. Use of other than authorized technicians will void the warranty.