



COMPUTER CONTROLLED INTEGRAL DENTAL UNIT

MANUAL

Pls read the manual carefully before operation.

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ATTENTION: READ THIS MANUAL CAREFULLY BEFORE OPERATION

I、PRODUCT PROFILE

Thank you for purchasing our Integral Dental Units, a latest advanced Integral Dental Units with full-computerized auto-control; it has such advantages as solid structure, handsome shape, easy operation and high reliability as an ideal upgraded product for the modern dental clinics.

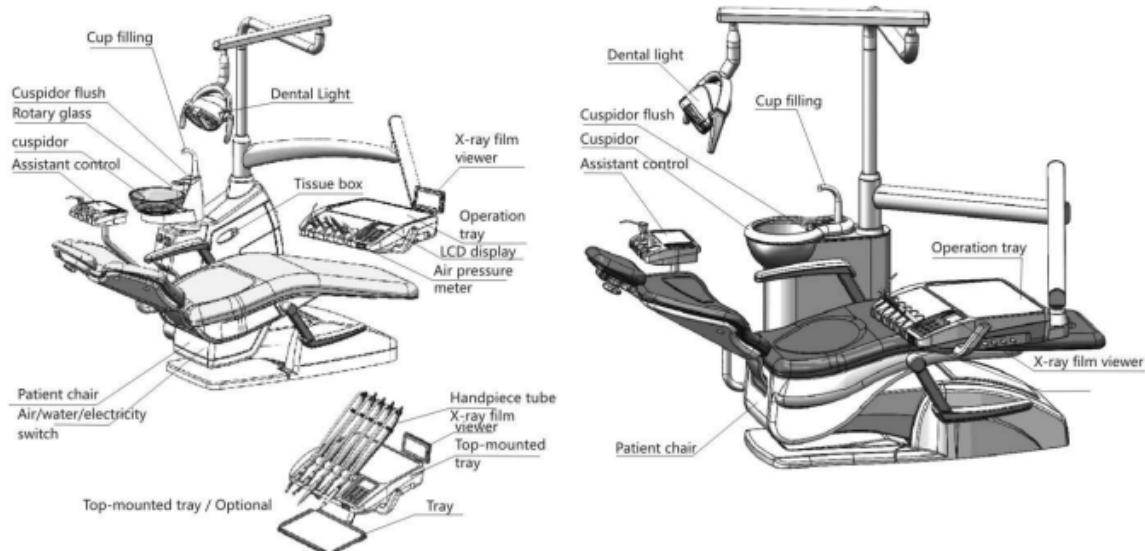
II、UNIT STRUCTURE

The components of the unit are the dental chair, connection of the handpiece, operation light, operation tray, 3-way syringe, weak suction, strong suction, cuspidor, x-ray film viewer, foot pedal, water and air system.

The air, water and electricity of units are connected from the floor box (QL2028, QL2028I and QL2028II is external floor box, QL2028III and QL2028IV are built in floor box design). The floor box consist of air reducing valve and water filter, which is for purifying the air , water and electricity for units.

Air on/off for both high and low speed handpieces are controlled by foot controller. Water and air for each handpiece, strong and weak suction are controlled by corresponding valve.

Side box with built out pure water bottle is convenient for users to use pure water and switch between purified water and tap water so that handpieces usage can be prolonged



III、 TECHNICAL DATA

This machine belongs to Type I Model B.

Power supply: AC220V Frequency: 50Hz

Input power: 800VA

Blown fuse specifications: Mains power supply: FR1-20 $\phi 5 \times 20$ 5A

The dental chair's continuous loading time ≤ 2 min

The dental chair's loading continuance $\leq 60\%$ (The dental chair's working hours/interval)

Gargling water temperature: $40 \pm 5^\circ\text{C}$

Foot Switch: ZPX4

Max. rev. of the high-speed Turbine: $\geq 300000\text{r/min}$

Max. output torque $\geq 6\text{g.cm}$ (Air pressure: 0.22Mpa)

Max. rev. of the low-speed Motor: $\geq 20000\text{r/min}$

Max. output torque $\geq 10\text{g.cm}$ (Air pressure: 0.3Mpa)

Input air pressure: 0.55~0.6MPa Flux $\geq 50\text{L/min}$

Input water pressure: 0.2~0.4MPa Flux $\geq 10\text{L/min}$

Environmental temperature: $5 \sim 40^\circ\text{C}$ Relative humidity $\leq 80\%$

Max. Loading of the instrument tray: $\leq 30\text{N}$

Note: In this machine, the blue tube is for waterway, the white tube is for the working airway, and control airway.

IV. Function Symbols



Model B equipment



Descending when clocking



AC



Protective



Gargle button



Cuspidor



HEATING BUTTON



Ascending



Descending



backrest tilt back



backrest tilt forwards



reset



memory

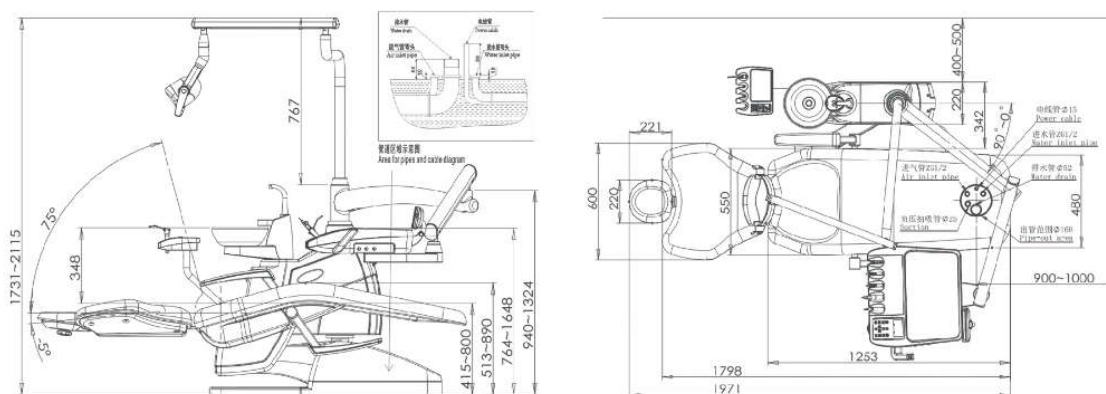


terminal position

V. Installation

1. Preparation

Decide where to install the machine according to the overall arrangement, lighting and availability of the clinic. Put the machine in a clean, dry, draughty and cool place as good working conditions. Make sure that the dental chair chassis contacts the even and solid floor. Under the floor box, there must be inlets/outlets for water, gas and electricity for the machine within the range of $140 \times 120\text{mm}$. The water inlet pipe and air intake pipe should be the 8×5 PU pipes. The drainpipe should be the hosepipe at $\Phi 40\text{mm}$ ($3/2''$). The port of each pipe is about 40mm away from the floor. The input wire should be the 3-core 1mm jacketed cord, about 400mm away from the floor. And connect the protective ground wire well.



Installation diagram of built-in floor box

2. Unpack the Carton for Inspection

Unpack the carton to verify that the whole machine is intact. And check whether the accessories and spare parts are complete and intact according to the packing list. For any questions, please inquire the dealer or our company at once.

3. Installation of the Mainframe

Firstly, put the dental chair in the right place. The design of this machine considers the stability of the whole machine, so the foot-fixing screws are unnecessary. But the dental chair chassis must contact the even and solid floor for fear of accidents.

In case of rotation or declining of the whole machine due to the uneven floor, one can fasten the six M12 inner hexad flat end fixing screws into the six M10 screwed holes on the dental chair chassis, and make it fully contact the floor. During the adjustment, please keep the whole machine even and guarantee as many contact points as possible, so as to ensure the stability of the whole machine.

4. Installation of seat cushion

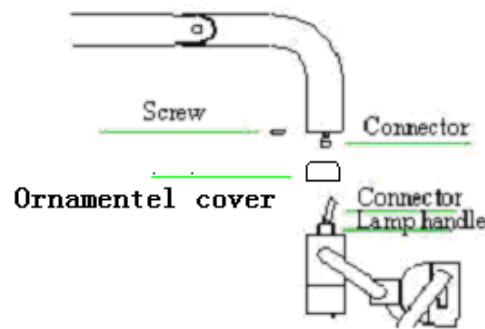
Firstly adjust the backrest to the supine position, and insert the two round screws of the seat cushion into the hole of the chair. Then move the cushion along the rectangular channel to make it appressed with the chair. Tighten the screws up after set it in the right position, screw on the front should be positioned.

5. Installation of Dental Lamp

Put the wire from the lamp arm through the lamp stand, and then connect the two well. After that, connect the wire connector on the lamp arm to that in the dental cabinet, and put them into

the column. Then put the lamp stand onto the column, and put the lamp arm in the right place. (Note: don't damage the wire.)

Connect the lamp base wire insert through the decorative jacket to the lamp arm wire insert, insert the lamp base handle into the lamp arm hole, and fasten it with screws (see Fig. 3), and then cover the screw and seam with the decorative jacket.



6. Installation of the Floor Box

Screw the two G1/2" × ϕ 8 tube joints into the water inlet pipe and the air intake pipe respectively. Pay attention to the air tightness during the connection, and prevent air or water leakage. Uncover the floor box, and install it horizontally (to smoothen the drainage system of the whole machine) instead of higher than the floor. This position must prevent the flow pipe that connects the cabinet to the floor box from bending when the dental chair moves up and down.

7. Piping

Before connecting the pipeline to the dental unit, one must remove the dirt and impurity from inside the pipe, so as to prolong the machine's service life. Connect the $\Phi 8 \times 1.5$ PU pipe to the water supply and air supply well, and pay attention to the air tightness (see Fig. 2). In addition, insert the white plastic drainage joint into the drainpipe nozzle, and connect the drainpipe well. Pay attention to the fastness and air tightness.

8. Power supply connection

The machine is equipped with the single-phase three-pinned socket in advance. Without the connector, the user cannot switch it on until the electrical outlet is connected to the ground wire.

9. Handpiece Installation

According to the requirements in the user's manual, connect the handpiece well, and prevent it from idling long or over-pressure start up.

10. Test

The machine is in the debug phase after install. The machine will be on standby after Connect the air, water and electricity.

Open the floor box to check the air reducing valve. The pressure should be 0.6mpa. If not, it should be adjust to 0.6mpa. (The way is pull up the valve at the top of the air reducing valve, then rotate the valve. The pressure will be rise when clockwise rotation, otherwise it will be reduce.

VI. Operation Instruction

1.High speed handpiece connector

Take up the handpiece tube from the handpiece hanger and connect the turbine handpiece. Step on the switch on the left of water control, then the turbine handpiece will go round to spray out cooling water, which means the high-speed turbine handpiece begin to work; Step on the switch on the right of air control, then the turbine handpiece will go round to spray out air, which means the high-speed turbine handpiece begin to work; Step on the switch on the middle of foot peddle, then the turbine handpiece will spray out air without rotating. Meanwhile adjusting the related water regulation valve can adjust the power of fog and adjusting the related air regulation valve can adjust the air pressure of the turbine handpiece (The air pressure of voltmeter is 0.25MPa when the handpiece works normally). Release the switch of foot peddle and put it back to the hanger after usage.

2. Low speed handpiece connector

Take up the low speed handpiece tube from the hanger and connect the low speed handpiece. The operation method is the same as turbine handpiece's. Adjusting the related water regulation valve can adjust the power of fog and adjusting the related air regulation valve can adjust the air pressure of the turbine handpiece (The air pressure of voltmeter is 0.3MPa when the handpiece works normally).

When adjusting the water and air, please adjust it from small to large and adjust it the nebulization to be optimum successively. Note: Pls do not make the handpiece just round without working or start the handpiece with over high pressure , or it will affect its working life.

3. Handpiece water supply

Water regulating valve, scrap- blowing air valve and Handpieces air pressure regulator are installed under the tray. Water volume can be regulated by water regulating valve and ensure the optimal water for handpieces. With handpiece air pressure valve, the air pressure for high speed handpiece should be 0.22MPa-0.25MPa (see in the air pressure indicator), while low speed should be 0.25MPa-0.3MPa.

4. Operation light

LED operation light intensity is adjustable from 5000lux to 25000lux.

Regulating instruction: Please keep your hand 3S close to the oral LED light sensing head 5CM-8CM in the state of lights on. The light will automatically in regulating state. when hear the "beep" in the first time, the light intensity is strongest. once heard the "beep" again, the light intensity is weakest. Please move your hand away until there is the light intensity you need.

5. Saliva ejector

This unit has saliva ejector which will start operation the moment when it is taken off the rack. Weak ejection is realized by water suction, therefore it must be connected with water supply which can ensure its lowest operation water pressure.

6. Gargling water

The gargling water supply system of this unit has constant temperature and water quantity setting functions. As its warm water is supplied by internal constant-temperature water-heater, please press the heater switch if warm water is required (Fig.7), with water heater working in the same way as for three-way syringe. Water output is controlled by built-in computer control panel which can be set by the user at will. Please press "SET" on control panel of the instrument tray firstly when setting, and indicator light goes on, then place an empty cup on the outlet of

gargling water and press “Gargling Water” on the control panel continuously, the water will come out. Release the key until water in the cup reaches the level what you want, and the water flow stops. Finally press “SET” on control panel again and indicator light goes out. All above procedures are memorized by the computer and setting completed. In actual using, just press “Gargling Water” on the control panel once, the computer will fill water once automatically according to the set value, which is set by the user at his/her will.

During gargling water supplying, just press “Gargling Water” again if you want to stop the water. The way of inputting the same signal to terminate the corresponding actions during operation is also valid for other functions.

7. Water bottle

Water for handpieces is directly from the water bottle, therefore the bottle shall be supplied with medical distilled water on time, with water filling described as below: Turn off the air switch beside the water bottle firstly. After all the compressed air in the bottle discharged, hold the water bottle securely and turn clockwise to take it off. Then fill water in it and turn it on counter-clockwise, until it fixed on the bottle cup tightly (Air tightness must be regarded). Finally turn on the air switch and water filling completed.

8. Headrest holder

The headrest holder of this unit has two optional adjusting locations, one is for adults and the other is for children. Angle and height of the head holder in each location are adjustable (Fig.8). If you want to adjust the angle of the head holder, first hold the head holder, then turn handle 1 to the position you want and tighten it. As for the height of the head holder, just pull out or push down the head holder to the required position directly and make the head holder in its best way by small adjusting. Attentions: After adjusting the position of the head holder, it must be locked tightly to avoid accidents during operation.

9. Ascending/Descending of the dental chair

The dental of this unit has two controls and moving of the dental chair can be controlled by control panel or the foot switch, either one will do.

As for the ascending of the dental chair, just press the control key above the dental chair symbol on the control panel with upward arrow on it; or step on the foot switch on the arrow upward, the dental chair will go up, meanwhile, corresponding indicator light on the control panel turns bright. Release the key and dental chair will stop rising and light will become dark. If pressing the control key continuously and the chair reaches its extreme position, it will stop moving automatically even if pressing the key on.

The same way is for the descending of the dental chair, just pressing control keys above the dental chair symbol with arrow downward. There is also lowest limit for descending.

Remark: As there are moving parts in the dental chair of this unit, while the unit is connected with these moving parts and moves with the dental chair, please ensure there is nothing touchable within the whole travel distance of the unit to avoid accidents.

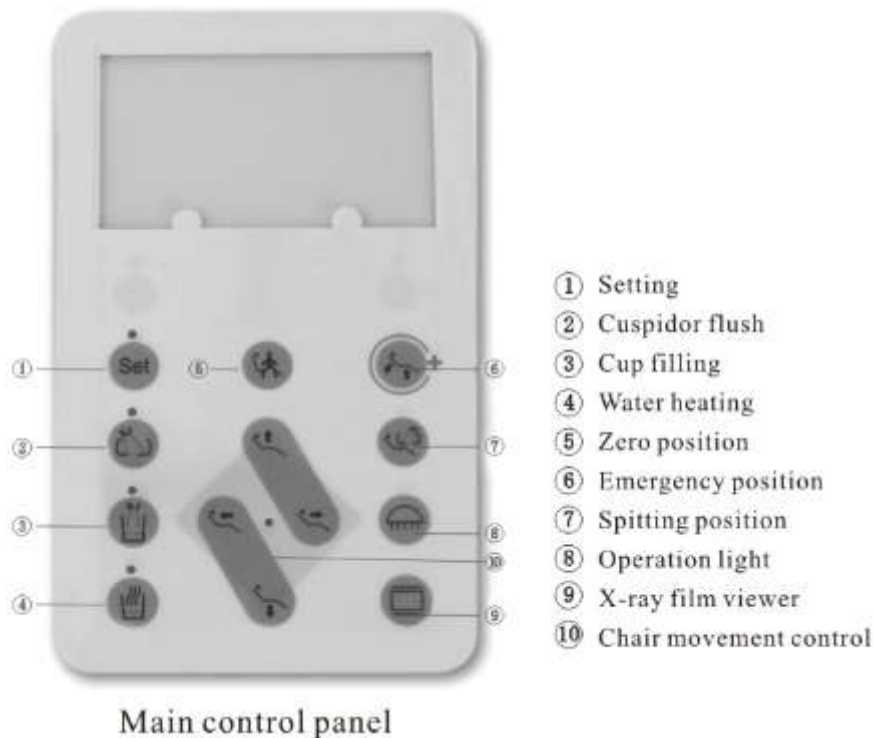
10. Chair backrest adjusting

Direct control of the chair backrest turning angle is in the same way as that for chair ascending, only the control keys are the two with arrows pointing outward beside the dental chair symbol, the arrow pointing left is for leaning backward. There are also extreme limits for turning angle of the dental chair.

Remarks: Since the dental chair backrest moves in relatively large scope, it must be ensured there is nothing touchable within the moving scope during operation to avoid accidents.

Remarks: *1. From technical view, the pressure indicated by pressure meter on the instrument tray has certain deviation from the working pressure of the air turbine handpiece, exactly equals to the pressure loss in the connection pipe. Practically saying, it is very useful to regard the indicated pressure on the instrument tray as the working pressure of the handpiece, as it is favorable for service life of the handpiece.

11. Main control panel operation



Main Control Panel

“SET”Button

①water supply setting

Water output is controlled by built-in computer control panel which can be set by the user at will.

Please press “SET” 5 seconds on control panel of the instrument tray firstly when setting, and indicator light goes on.

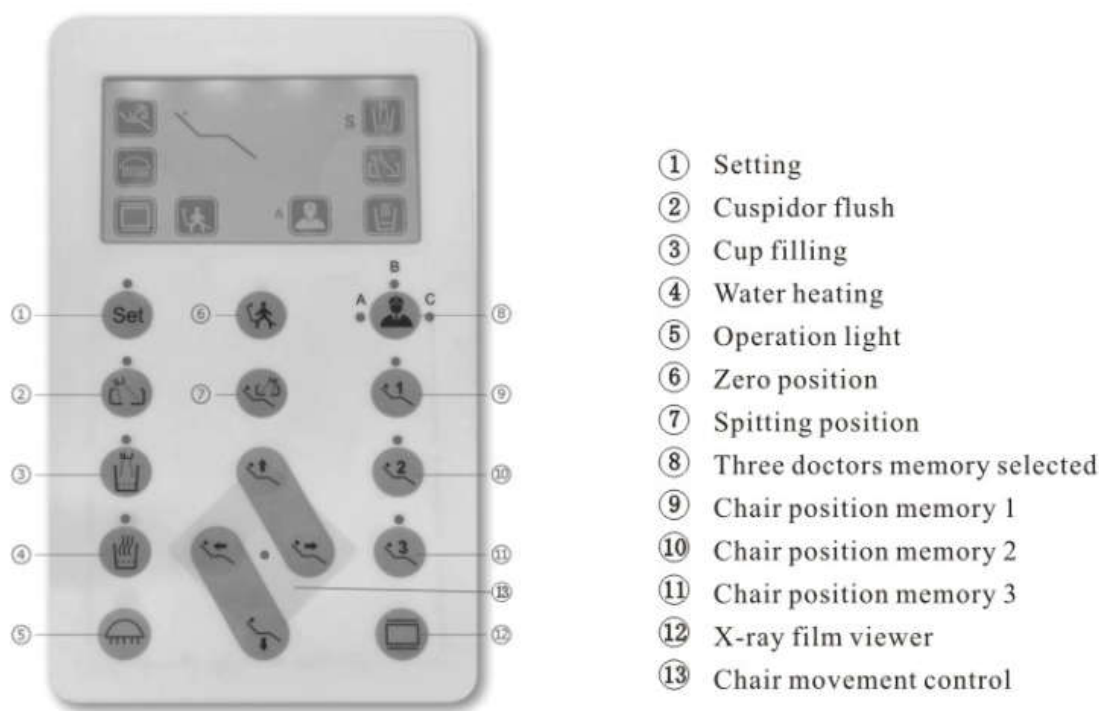
Then place an empty cup on the outlet of gargling water and press “Gargling Water” on the control panel continuously, the water will come out. Release the key until water in the cup reaches the level what you want, and the water flow stops.

Finally press “SET” on control panel again and indicator light goes out. All above procedures are memorized by the computer and setting completed. In actual using, just press “Gargling Water” on the control panel once, the computer will fill water once automatically according to the set value, which is set by the user at his/her will. (If water supply need to be changed due to water pressure or different size of cup, please reset according to the above steps.)

This setting will be memorized by built in computer when chairs are power off.

②Spittoon Cleaning Time Setting

- 1). Press SET 5 seconds continuously, and indicator light goes on.
- 2). Press cuspidor cleaning key, with detailed time limit described below:
 - A. Press once, the water will flush for 3s and indicative tone sounds once.
 - D. Press twice, the water will flush for 15s and indicative tone sounds twice.
 - E. Press three times, the water will flush for 60s and indicative tone sounds three times.
 - E. Press four times, the water will flush without automatic stopping and indicative tone sounds four times.
- 3). Please press “SET” again after setting finished, then the indicator light will become dark and setting completed. All these are memorized by the computer for future use, just press the cuspidor cleaning key gently and water will come out automatically and stop at the set time. (The water will stop once pressing cuspidor cleaning key during water flushing.)
- 2) Cuspidor flush key:** Water amount can be controlled by the setting time with this key.
- 3) Water supply key:** cup filling can be controlled by the setting time with this key.
- 4) Water heating key:** With switch control function for water heating and temperature protection. The heating temperature machine has been adjusted, which is no need for users to reset.
- 5) Zero Position:** Pressed this key before or after treatment, dental chair run immediately to the initial state; seats dropped to the lowest position
backrest forward to the limit position; which is convenient for patients. This action can be stop by pressing any keys
- 6) Emergency position:** Press the emergency position button, dental chair will reach its highest position and the backrest will reach its lowest position.
- 7) Spitting position setting:** Press the spitting position button, backrest upward, bowl rinsing starts and light turns off at the same time; press again, the chair return to working status; backrest backward, bowl rinsing closes and light turns on; press any button on the control panel, it will stop the movement immediately.
- 8) Operation light key:** press the button, the operation light turns on; press again, the light turns off.
- 9) X-ray viewer key:** press the button, the x-ray viewer turns on; press again, the x-ray viewer turns off.



Main Control Panel with memory system

Chair position setting

3 doctors with 9 sets of chair position memory, each doctor has 3 chair position memory (only applicable to dental unit with system)

Chair position “A”、“B”、“C”: After setting, doctors can select the chair position among A,B,C.

The corresponding indicate light  will be on during choosing.

“S1”、“S2”、“S3”: different chair position can be chose by pressing these keys. The corresponding indicate lights “”、“”、“” will be on during choosing.

During the operation, the corresponding icons “”、“”、“”、“” will flash on the screen.

2) Chair position memory setting

3) A1+(S1,S2,S3) is three sets of chair position memory.

B2+(S1,S2,S3) is another three sets of chair position memory.

C3+(S1,S2,S3) is the last three sets of chair position memory.

For example, press SET for 5 seconds, the indicator light will go on and the SET icon in the display screen shows the setting state.

At this moment, the height of electric chair could be adjusted by UP, DN, BU and BD. In addition, You could also adjust water flushing time and water supply time(Pls check step ①②) in this way.

Press A1 after setting is done.

S1: Press SET again, the indicator light will go out and the SET icon in the screen will be hidden, which indicates the chair position memory is set. The rest can be done in the same manner.

The setting will be saved after power is cut off.

3) Manual limit position setting

Press SET for 10 seconds, the indicator light will go on, the SET icon will be shown in the display screen and buzzer will sound.

At this moment, the highest position of chair and the most upward position of the backrest could be adjusted by pressing UP and BU.

Press SET again, the buzzer will sound again.

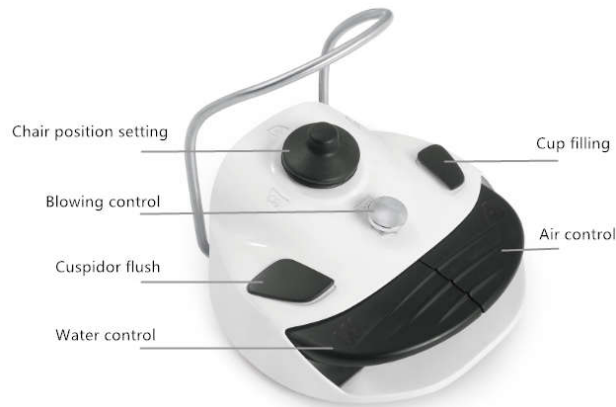
At this moment, the lowest position of chair and the most backward position of the backrest could be adjusted by pressing DN and BD.

Press SET again, the indicator light will go out, the SET icon in the display screen will be hidden, which indicates the chair position setting is done.

The setting will be saved after power is cut off.

4) Other keys introductions, please refer to the above introduction for control panel without memory system.

12. Instructions for foot switch



A Chair position setting: this control is used for up and down of the chair and backward and forward of cushion.

B Cup filling: push this button, automatic water supply to the cup

C Cuspidor flush: push this button: automatic cuspidor cleaning

D Blowing control: push this button, the handpiece is blowing to clean the crumbs.

E Water control: push this button, the handpiece is worked by the water.

F Air control: push this button, the handpiece is worked by the air

G Pressing both pedal for air and water control, handpieces will work and with water fog.

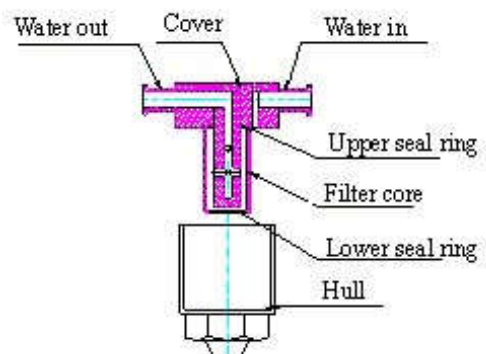
VII Maintenance

1. Cleaning & Lubrication of the handpiece

Please refer to operation manual of the handpiece.

2. Water filter

Water filter is installed at water inlet of the floor box of the unit to block off the impurities in the water (Fig.10), so as to ensure normal operation of the unit. After long time service, the filter core may be choked up by dirt, therefore must be cleaned or replaced to ensure normal water flow.



Generally, cleaning or replacing the filter core once any of the following things occurs:

- i. Already used for more than a year;
- ii. Pressure loss of the filter core exceeds 0.1Mpa;
- iii. Filter core contaminated;
- iv. Water output is not clear;

Procedures for cleaning/replacing of the filter core: Open the floor box cover and take out the water filter, remove the water filter hull by turning it in counter-clockwise direction, then take off the seal ring and filter core in turn. After cleaning or replacing them, assemble the water filter back in reversed sequence and pay attention to its air tightening.

3. Filter reducing valve

In order to ensure clean dry air of stable pressure input in this unit, air filtering reducing valve is installed at the inlet of the floor box to control the air pressure not to exceed its set value and also eliminating the impurities and moisture in the filtering air to some extent. The water content filtered will be condensed in the filter cup and shall be discharged after long time filtering to ensure satisfactory filtering effects.

Water discharging of the reducing valve must be performed if any of the following occurs:

- i. Already used for more than a week;
- ii. Water in the filter cup reaches three-fourth of the total volume;
- iii. Water color changed in the filter cup (not clear any more).

Procedures for water discharging of the reducing valve: Remove the floor box cover, turn the nut under the filter clockwise by hand, then the water will flow out. After all the water has been discharged, screw up the nut counter clockwise. In order to keep it clean around, you can place water-absorbing items, such as cotton cloth, toilet paper, sponge, etc., at the water outlet to absorb the discharged water.

4. X-film Viewer

X-film viewer is used for watching X-films, while it may be damaged after long time service and just replace it if that occurs.

Operation steps:

- i. Cut off power.
- ii. Remove the back cover and you can find the U-shape energy-saving light tube (220V,7W) in it, check whether the light tube is loose or damaged, repair or replace it, then assemble it back as before.

Attentions: The light using 220V high-voltage electricity, please be sure to cut off power supply before handling.

5. Holding rack valve

Insert the core of the rack holding valve into the rack holding box and fix it with fastening screw, with interval between the core valve and detector adjustable. Under normal conditions, place handpiece or saliva ejector into the holding rack and push in the detector. Make the valve core moving left and block air route with four 1.2 rubber O ring. In case that the air flow does not stop even after inserting the handpiece, or there is air leakage after saliva ejector or handpiece put back into the holding rack, just loosen the fastening screw and move the holding valve right, check whether the valve can be locked to cut the air flow. If it does not work, it is necessary to disassemble the rack holding valve to see whether O ring has been damaged.

Detailed steps:

- i. Cut off air supply.
- ii. Loosen the fastening screw and take out the rack holding valve. Pull out the valve core and you can find the O ring (Fig.11).

6. cuspidor

It should be clean regularly and once in a day.

7. dental chair

The dental chair must be clean and disinfection after use timely. Neutral detergent or disinfectant are workable.

8. handpiece

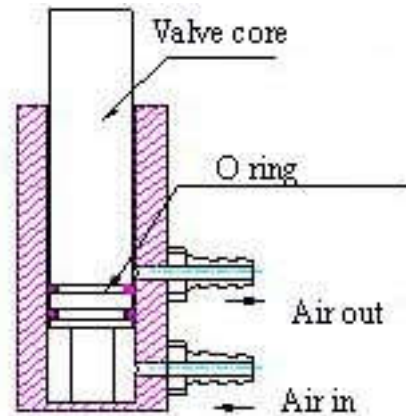


Fig.11 Rack Holding Valve

The instructions and maintenance of high and low speed handpiece is marked in the instruction. Please kindly check it.

9. operation lamp

The instructions and maintenance of operation lamp is marked in the instruction. Please kindly check it.

10. The dirt is inhaled with the saliva when it is in suction and store up in the suction filter. So the filter should be clean timely in each week.

VIII Precautions

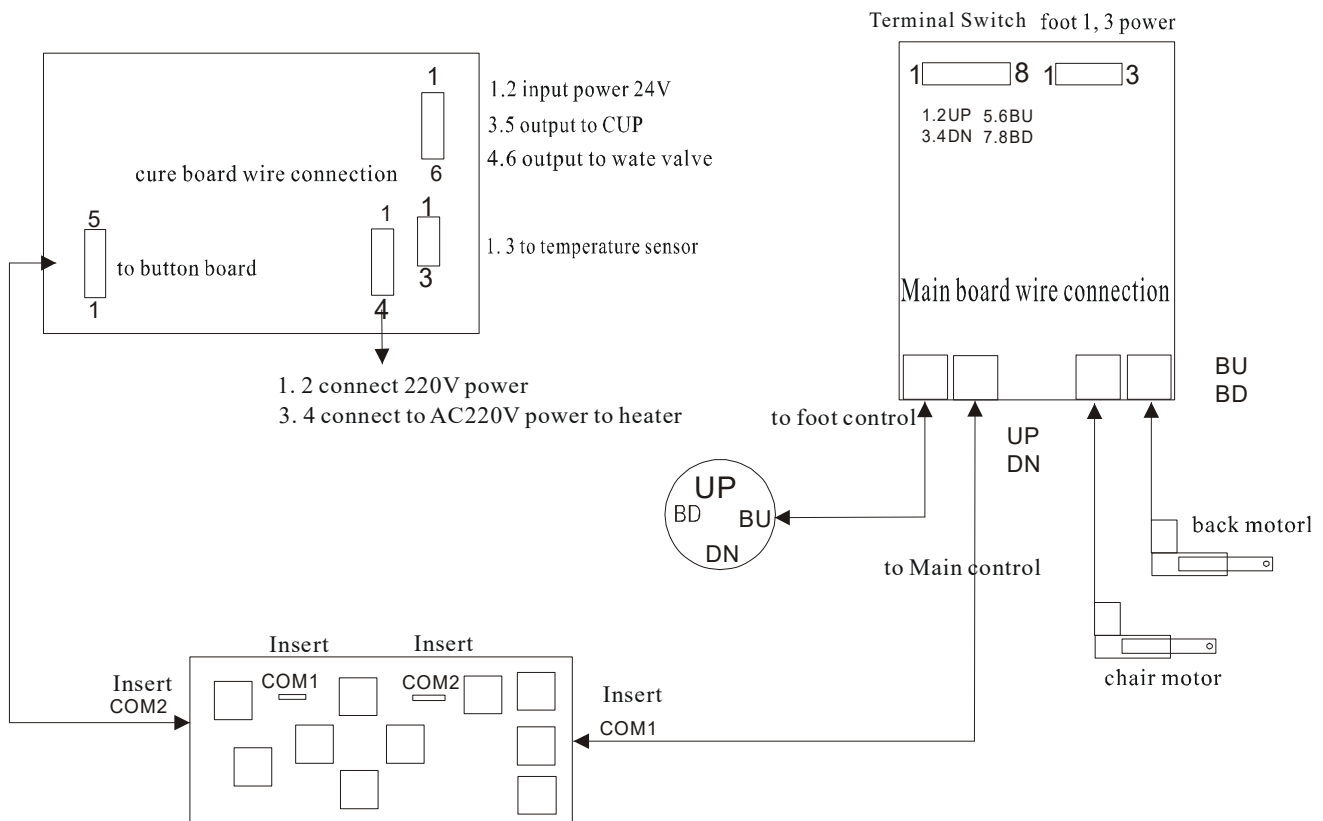
1. During the operation of the dental chair, it must be ensured there is nothing touchable within the travel scope of the chair.
2. Remove the deposited water in the filter reducing valve in time.
3. Clean or replace water filtering core in time.
4. Filter cup of weak ejection must be cleaned once every month.
5. During direct control of the dental chair ascending/descending, the control key must be pressed on continuously until to the position wanted.
6. After the head holder has been adjusted to the required position, it must be locked before using.
7. Power supply must be cut off when replacing electric components.
8. Power supply must be cut off before maintaining and cleaning of the unit.
9. Optional parts equipped on this unit, such as the tooth scaler and curing light, must be excellent CE products.
10. Transportation & storage environment:
 - a. Ambient temperature: $-40 \sim +70^{\circ} \text{C}$;
 - b. Relative humidity: 10%~100%, including condensation;
 - c. Air pressure: 500~1060hPa.

The unit must be protected from rain during transportation and handle it gently to avoid shock. The packed unit shall be stored indoors where the relative humidity not exceeding 80%, no corrosive gas and air flows well.

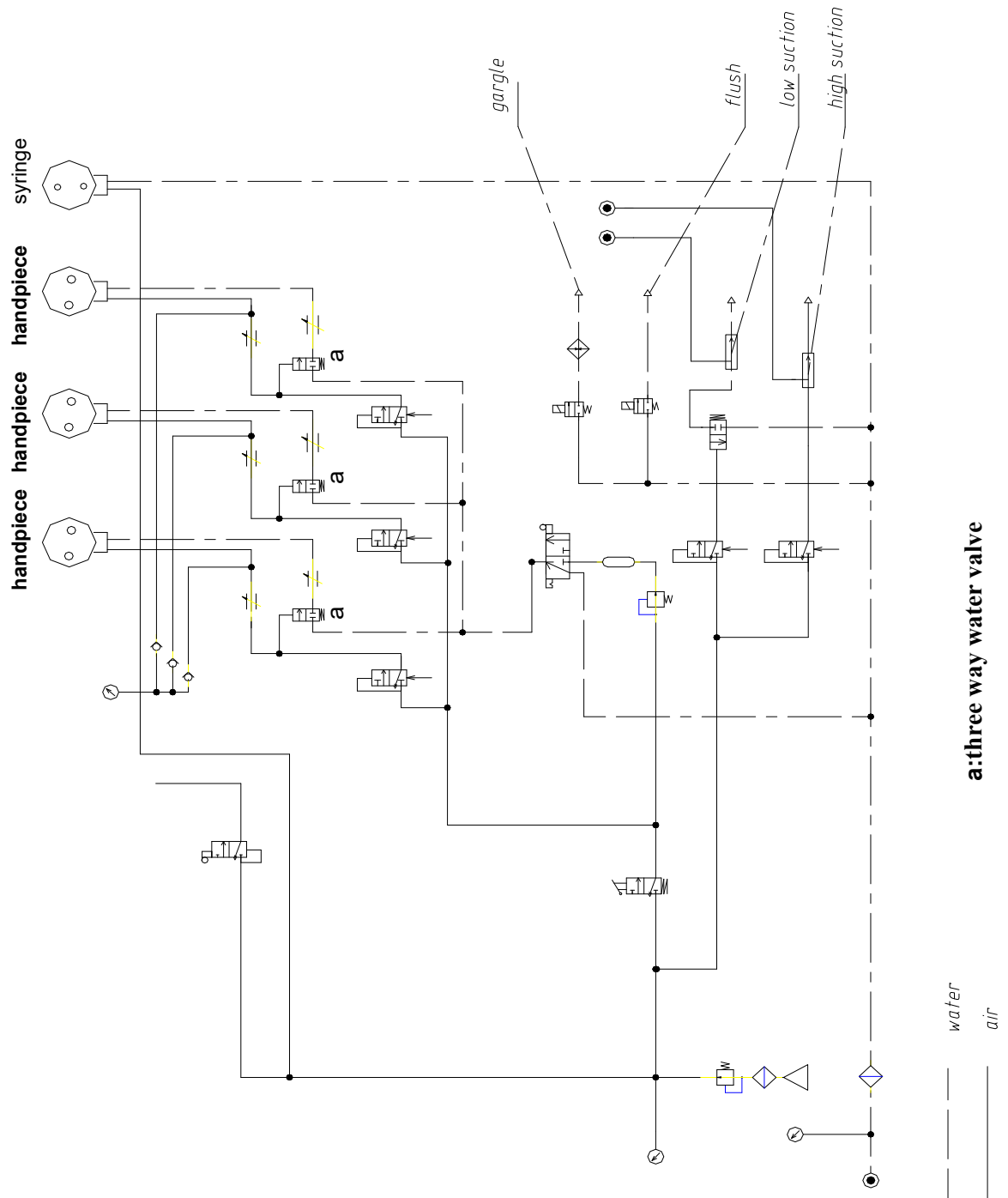
11. Disposal of waste water and other things must meet the local environment protection regulations.

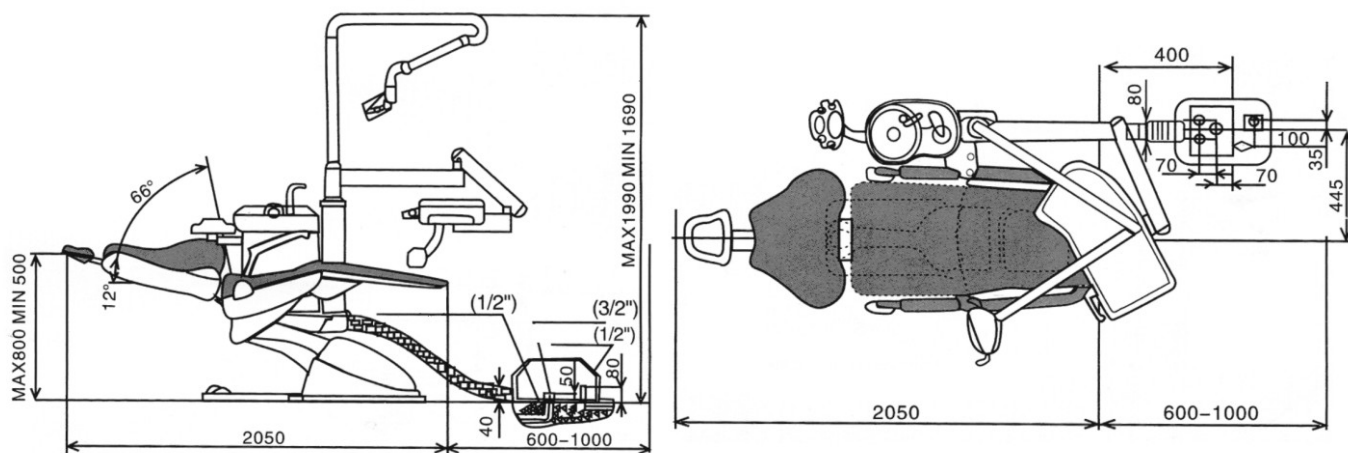
12. Maintenance of the unit must be done by the professional technicians designated by our company. The unit may be damaged if the user disassemble and repair it on his/her own, and it will not enjoy our maintenance service any more if that occurs.

IX、ELECTRIC CHART

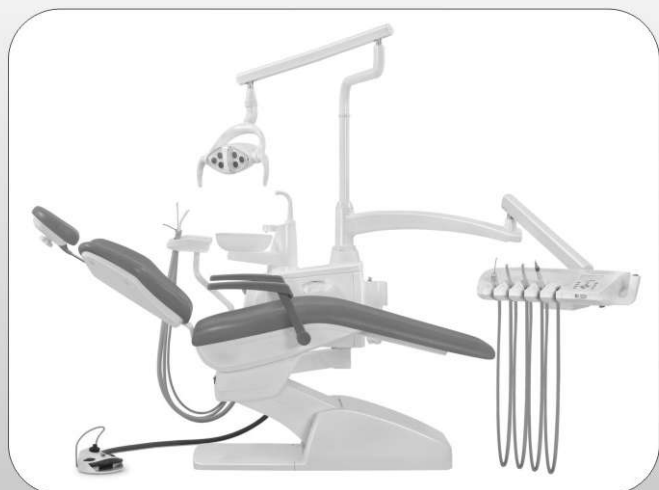


X、 WATER AND AIR CHART





Installation diagram of built-out floor box



More DENTAL UNITS for you