TR-S DENTAL UNIT USER OPERATION MANUAL

Version:01/2016

1、ATTENTION:

DANGER

It means that it is danger for the human or the machine. Or it is important information for the user and the maintenance man, it should be paid attention.

WARN!

To change the electric power wire, It should be done by authorized technician.

WARN!

The color of live wire, earth wire , zero wire should be used according to the local laws and regulations.

WARN!

For the fuse, it should be changed according to the demand of the unit strictly.

WARN!

To assemble the machine, It should be done by authorized technician.

WARN!

Before do the maintain and reparation, it should drain out all the water and air in the machine. Then before use again, turn on the water and air switch first.

NOTICE:

Plastic cover cleaned by the cloth without water. PU part clean by cloth with water.

NOTICE:

Three way syringe sterilized according to its demand.

NOTICE:

The head of the suction is one time use.

WARN!

Use the soft and flat cloth to clean the cover and the operation LED lamp. To change the bulb of the operation LED lamp, it should be done by authorized technician.

WARN!

The limited weight of the dental unit is 500KGS, over loaded is strictly forbidden.

WARN!

Press any button of the dental unit, the dental unit will stop!

WARN!

Do not use the dental unit near the electric house and near the magnetic area.

WARN!

When dentist do the operation with other dental machine, it should shout down the electric power of the dental unit.

WARN!

The handpiece should be used according to its demand.

WARN!

Environmental protection

1.After treatment, the waste water and the waste thing should be deal according to the local laws and regulations.

2.If the dental unit and the spare part broken, or can not use any more, it should deal according to the local laws and regulations.

3. Whether the unit need to assemble one device to separate the silver and the HG, it should be done according to the local laws and regulations.

WARN!

If the detachable part or accessories are relevant to safety, it should be exchanged with original one.

NOTICE:

Before leaving the clinic, the water, air and electric switch should be shut down.

2、INTENDED USAGE

For dentist to do the oral treatment.

3、CLASSIFICATION

3.1. Type of protection against electric shock: Class I equipment;
3.2. Degree of protection against electric shock: Type B applied part;
3.3. Classification according to the degree of protection against ingress of water: IPX0
3.4. Equipment not suitable for use in the presence of flammable mixtures: Not Category AP / APG equipment;
3.5 Mode of operation: continuous operation with intermittent loading corresponding to the dental mode of working.

4、**TECHNICAL PARAMETER**

4.1 X-ray film viewer: A.C.24V,power 20VA

4.2 Operation light: A.C.12V,power 50VA
4.3 Heater: A.C.24V,Input power 80W
4.4 DC motor: D.C.24V.
4.5 Electric voltage: 230V\60Hz power 1100VA
4.6 Fuse：F250V/3.15A.L F250V/6.3A.L F250V/10A.L
4.7 Output pressure of the compressor shouldn't be lower than 500kPa;Air flux should not be lower than 50L/min
4.8 The pressure of the water supplier:200KPa—400KPa
4.9 Vacuum Pump:Vacuum pressure:
Not lower than 9 KPa
Flux:Not lower than 250L/min
4.10 Device operation mode: continuous operation with intermittent loading corresponding to the dental mode of working:
Motor Mode of operation: duty cycle: 2 minutes on, 20 minutes off.

5、**SYMBOL ILLUSTRATE**


Caution and Notice: Consult accompanying documents to get the safety information.


It means that it is danger for the human or the machine. Or it is important information for the user and the maintenance man, it should be paid attention.

Authorized Representative in the European Community

CE Mark: conforms to essential requirements of the Medical Device Directive 93/42/EEC.


Class II equipment


Date of manufacture.


Manufacturer

Specifies serial number


Type B applied part

Direct current

Sterilizable up to the temperature specified at most

The device should not be used after the end of the shown or the day

Consult the User Operation Manual

DISPOSAL: Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.

6.**EMC**

Guidance and manufacture's declaration – electromagnetic emissions - for all EQUIPMENT and SYSTEMS

Guidance and manufacture's declaration – electromagnetic emission		
The *MARE* is intended for use in the electromagnetic environment specified below. The customer of the user of the *MARE* should assure that it is used in such and environment.		
Emission test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The MARE must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected.
RF emission CISPR 11	Class B	Class A with IEC61000-3-2 Complies with IEC61000-3-3 The MARE 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.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Comply	

Guidance and manufacture's declaration – electromagnetic immunity – for all ME EQUIPMENT and ME SYSTEMS

Guidance and manufacture's declaration – electromagnetic immunity
The MARE is intended for use in the electromagnetic environment specified below. The customer or the user of MARE should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 KV contact ±8 KV air	±6 KV contact ±8 KV air	Floors should be wood, concrete or ceramic tile. If floor are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 KV for power supply lines	±2kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1KV line(s) to line(s) ± 2KV line(s) to earth	±1KV differential mode ±2KV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the MARE requires continued operation during power mains interruptions, it is recommended that the MARE be powered from an uninterruptible power supply or a battery.
Power frequency (50Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacture's declaration – electromagnetic immunity –
for ME EQUIPMENT and ME SYSTEMS that are not LIFE-SUPPORTING

Guidance and manufacture's declaration – electromagnetic immunity			
The MARE is intended for use in the electromagnetic environment specified below. The customer or the user of MARE should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the MARE, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.

Conducted RF IEC 61000-4-6	3 V_{rms} 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1.167\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = 1.167\sqrt{P}$ 80 MHz to 800 MHz $d = 2.333\sqrt{P}$ 800 MHz to 2.5 GHz 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). 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. Interference may occur in the vicinity of equipment marked with the following symbol: 

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

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption 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 the ELE007839V1 is used exceeds the applicable RF compliance level above, the ELE007839V1 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the ELE007839V1.

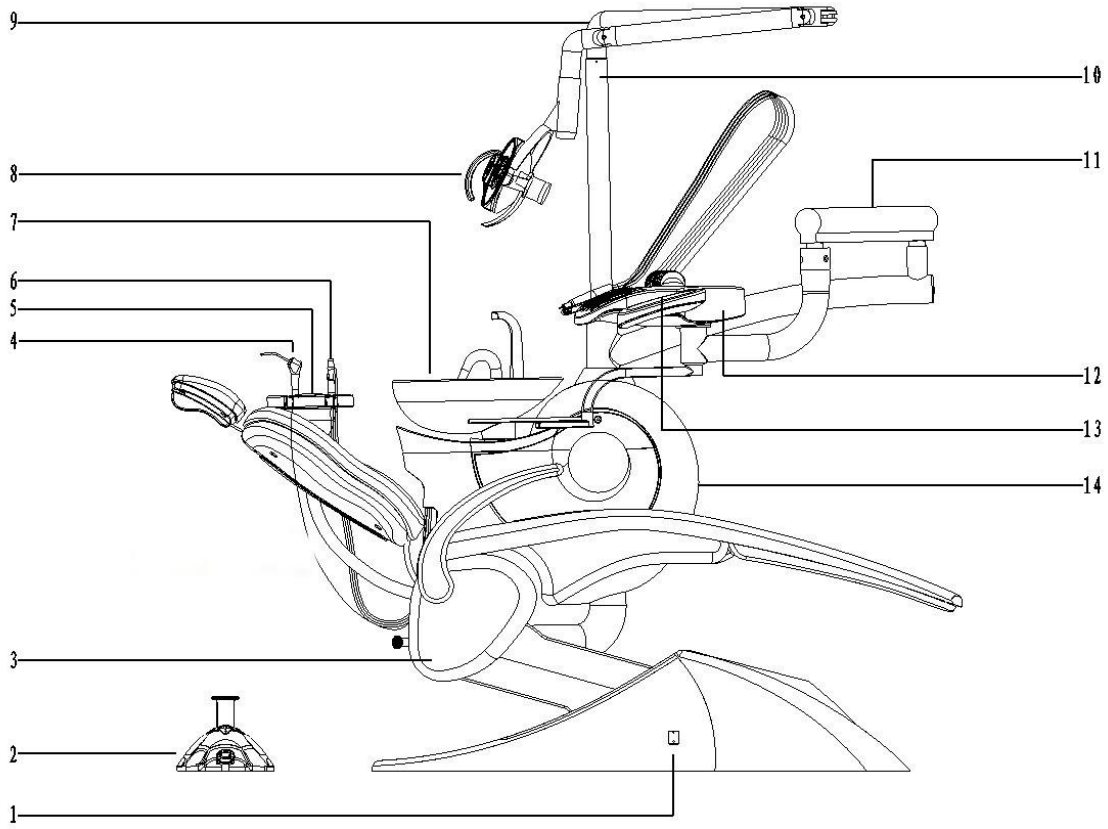
[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM – for ME EQUIPMENT or ME SYSTEM that are not LIFE-SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and the MARE Fitness Equipment.			
The MARE is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the MARE can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the MARE as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter** m		
	150 kHz to 80 MHz $d = 1.167\sqrt{P}$	**80 MHz to 800 MHz** $d = 1.167\sqrt{P}$	**800 MHz to 2,5 GHz** $d = 2.333\sqrt{P}$
0,01	0.117	0.117	0.233
0,1	0.369	0.369	0.738

1	1.167	1.167	2.333
10	3.690	3.690	7.377
100	11.67	11.67	23.33
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

7、OVERALL COMPOSITION



Picture 1: Structure of the dental unit

1 ---Electric power switch

2 --- Foot controller

3 ---Patient chair

4 ---Three way syringe

5 ---Assistant table

6 ---Suction

7 ---Cuspidor

8 ---Operation light

9 ---Arm of the operation light

10 ---Pole of the operation light

11 ---Arm of the instrument table

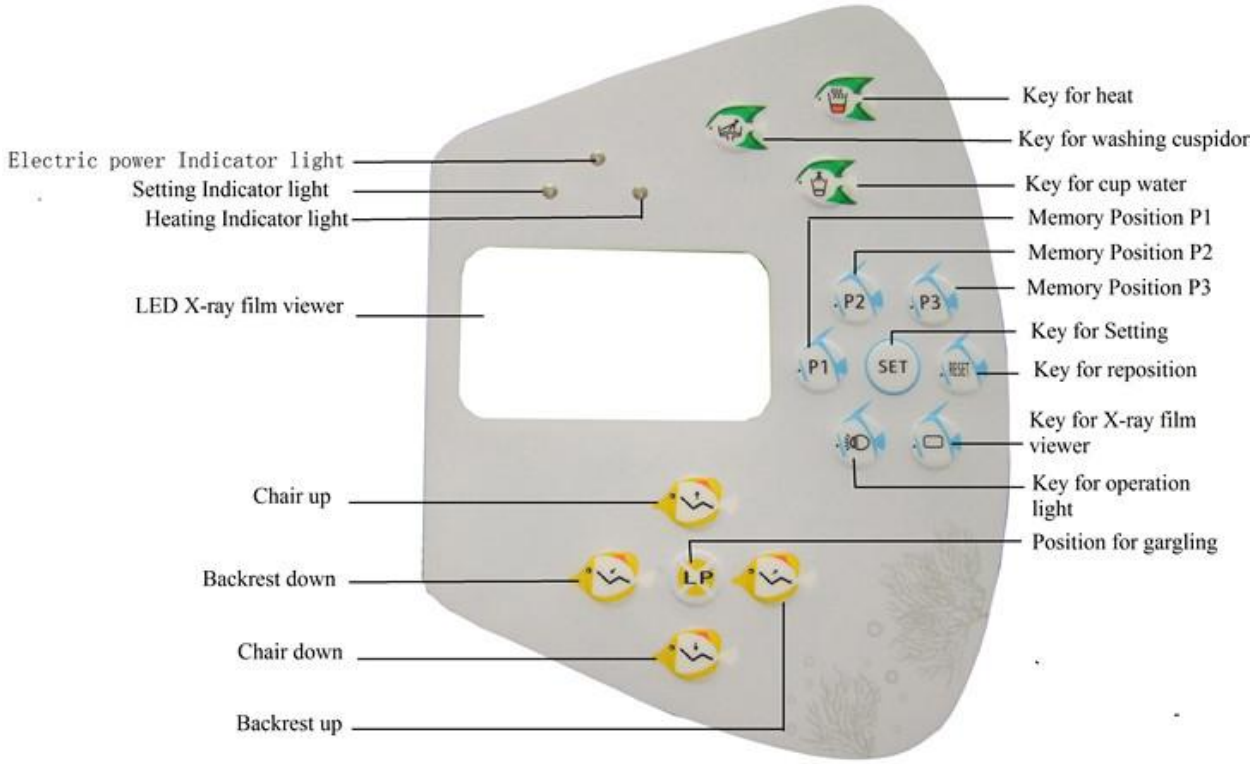
12 ---Instrument table

13 ---Pannel

14 ---Side box

8、**OPERATION**

8.1 Panel picture



8.2 Button for the chair position

Press“  ”,Chair goes down.

Press“  ”,Chair goes up.

Press“  ”,Backrest goes up.

Press“  ”,Backrest goes down.

8.3 Memory Position

8.3.1 Three memory position button

Three memory key“  ”、“  ”、“  ”,and push each key, the chair will move

to the memory position automatic.

8.3.2 Zero Key

Press“  ”,The chair will go the lowest position and the backrest will go the highest position automatic.

8.3.3 The position for patient to gargle .

Press“  ”,the backrest will go the highest position automatic,press “  ”again,the backrest move to the position before.

8.4 Gargle water control

Press“  ”,water come out automatic and will stop automatic at the default time. And before it stop, if you press “  ”again,the water stop at once.

8.5 Water to clean cuspidor

Press“  ”,and will stop automatic in the default time.And before it stop, if you press “  ”again,the water stop at once.

8.6 Heater control

Press“  ”,it begins to heat, the indicator light flash, and when the temperature reach the default degree, the heater stop,the indicator light normally on. If the temperature of the water go down, the heater work automatic. If press “  ” again,heater stop, the indicator light off.

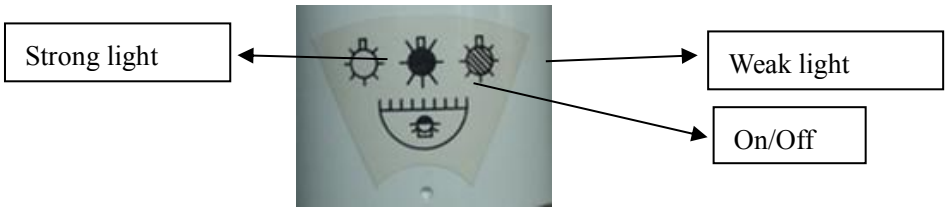
8.7 X-ray film viewer control

Press“  ”,X-ray film viewer on,press“  ”again,X-ray film viewer off.

8.8 Operation light control

8.8.1 Press“  ”,then it can control by the switch of the lamp.

8.8.2 It has four switch of the light. One for Strong light, one for normal light, one for weak light, one for on/off.



8.9 Foot controller

8.9.1 T1 Handle of the foot controller to move.

8.9.2 T2 Control the position of the chair:

Press“UP”,chair goes up.

Press“DN”,chair goes down.

Press“BU”,backrest go up.

Press“BD”,backrest go down.

8.9.3 T3 The switch to control the water for the cuspidor,press, water come out to clean cuspidor.

8.9.4 T4 the switch to control the water for patient garble:press,water come out.

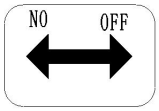
8.9.5 T5 switch for the water and air of handpiece:

a)Press only,for water of the handpiece;

b)Do not press, only move the head,for air of the handpiece.

c)Press and move,water and air of the handpiece.

8.10 Safety Switch



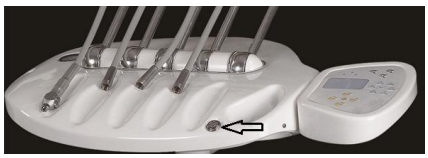
When chair goes down, if the cover of the chair touch anything, the chair will stop at once.

8.11EMERGENCY STOP SWITCH

During the treatment, if any urgent matter happen, you can push this switch, the machine will stop at once. And turn the switch by arrowhead way,the switch will return back.

8.12 Instrument table movement

8.12.1 Press the air lock switch just like the photo, you can move the instrument table up and down, and when you stop pressing, it is locked.



8.12.2 Instrument table can move by hand, until to the limited position.

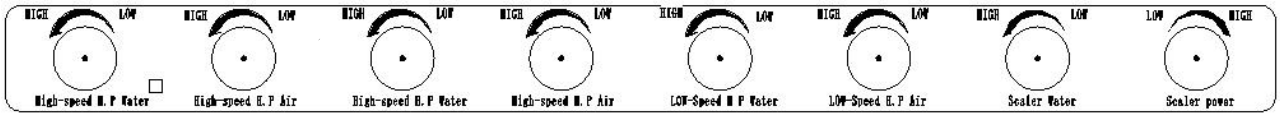
8.12.3 Instrument table can load least than 1KGS.

8.13 Handpiece operation.

8.13.1 Connect the handpiece like the photo. And the handpiece used should be according to the handpiece user direction.

8.13.2 Take out the handpiece from the holder, and push and move the head of the foot controller, the handpiece work, and the Pressure meter on the instrument table shows the pressure of the handpiece. Like the photo.

It can adjust the water and air of the handpiece with the switch, photo as follows,clockwise way is lower, and anticlockwise way is higher.



8.14 Three way syringe

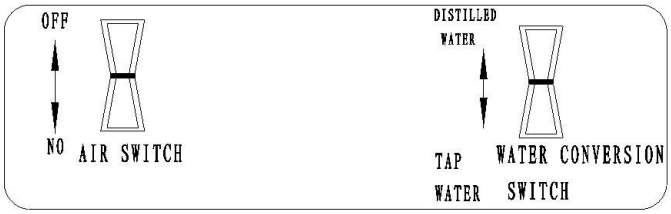
Press "1" Button, it is water, Press "2" button, it is air. Press both "1" and "2" button together, it is water and air. Press "A" , it can pull out the head of the three way syringe. The three way syringe on the instrument table, it is cold water, the three way syringe on the assistant table, it is hot water.

8.15 Sunction

8.15.1 When take out the suction from the holder, it works, take it back, it stop.

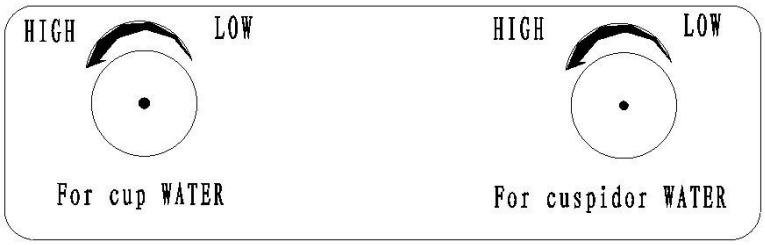
8.16 Water Supplier

It has two kinds of water supplier system for user choosing, one is tap water supplier system, another one is distilled water supplier system. User choose by the two switch like the picture. The left one is air switch, the right one is water conversion switch. If both these two switch up, it is distilled water; And if both these two switch down, it is tap water. If you want to add the distilled water to the bottle, the air switch should be down first.



8.17 Manual to adjust the flux of the cup water and the cuspidor water.

In the side box, there are two switch like the photo. It can adjust the flux of the cup water and the cuspidor water. The left one adjust the cup water. The right one adjust the cuspidor water.



8.18 Headrest, the picture as follows,

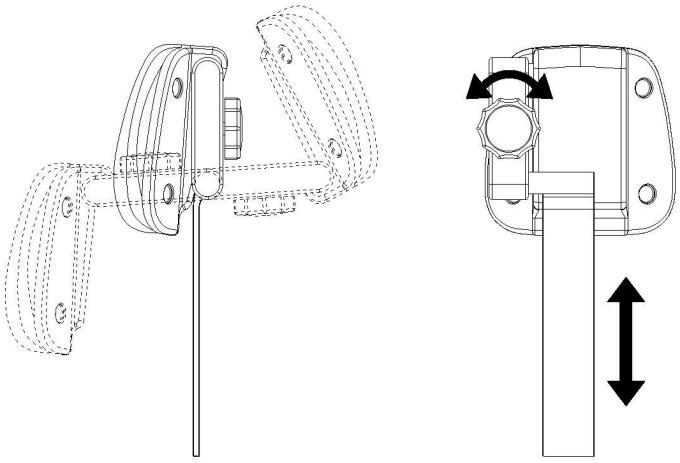
8.18.1 Headrest up and down：

Move the headrest up and down by hand.

8.18.2 Move the Headrest to any angle：

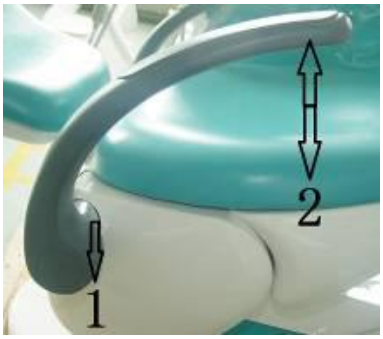
Turn the lock anticlockwise, then move the headrest to any angle you want. Then turn the lock clockwise, to fit this position. If move the headrest to the backrest, it can use for child.

Notice: After you adjust the position of the headrest, please be sure that the lock has been locked well. It is very important!!!



8.19 Electric power： Operate like the picture.

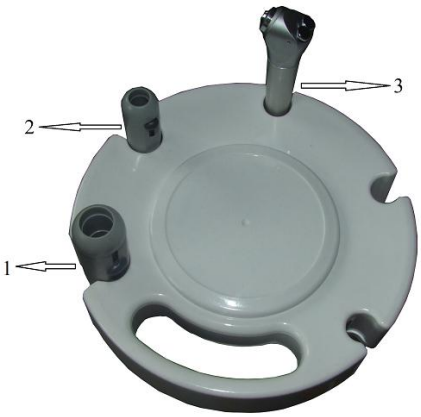
8.20 Armrest：



8.20.1 Handhold the position of "1"， pull out, then the armrest will move down.

8.20.2 Handhold the position of "2"， move up to the position, the armrest will lock automatic.

8.21 Assistant table

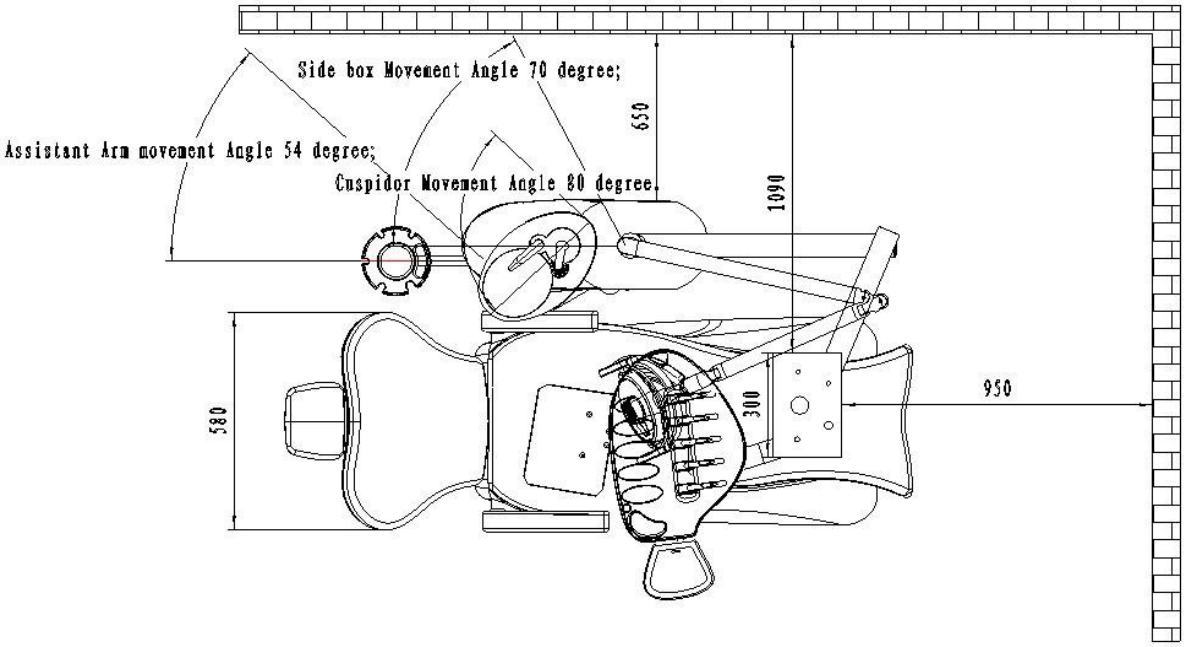


"1" and "2" is the holder for suction, take the suction, suction work, take it back, suction stop.

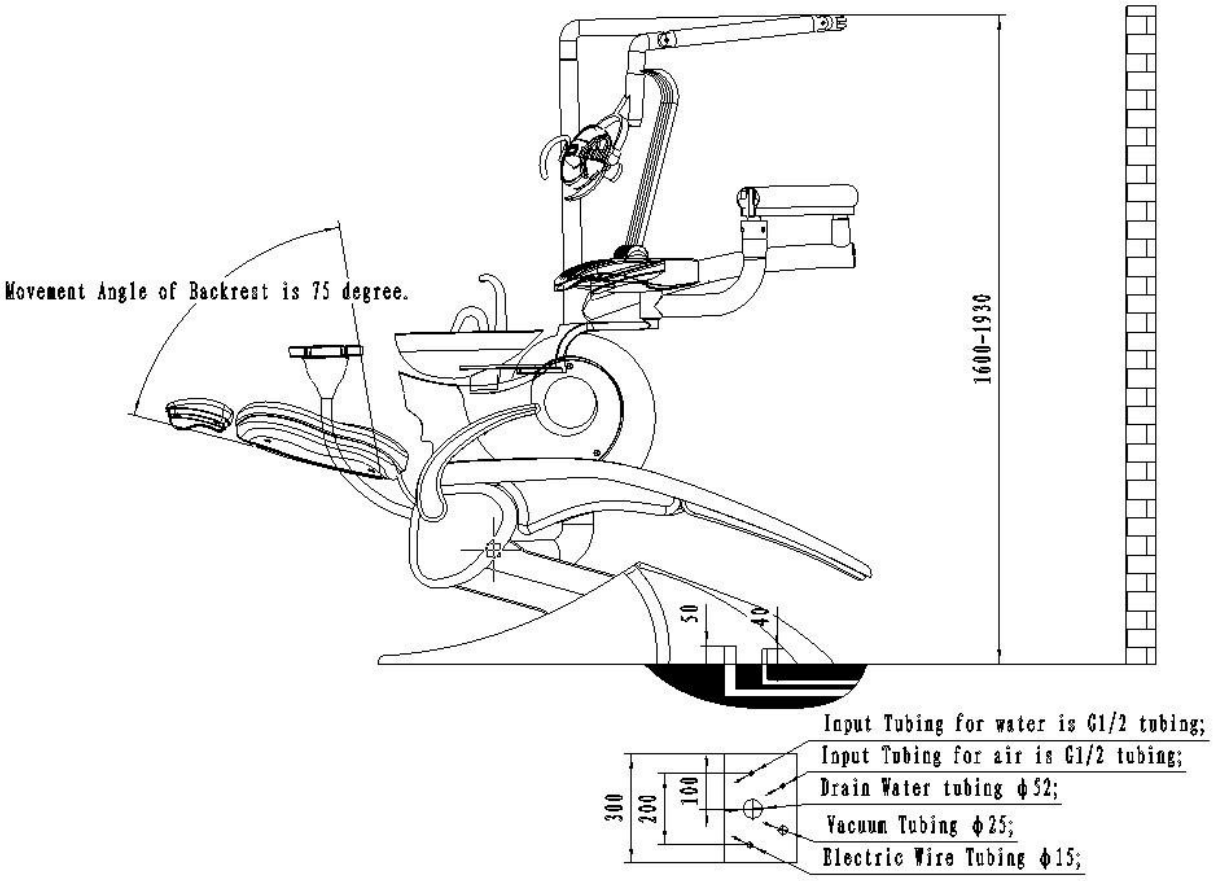
"3"is the holder for three way syringe.

9、 **Assemble**

9.1 Assemble drawing of the unit in the clinic is as follows,



9.2 Water, air, electric wire connect size drawing is as follows:



9.3 Assemble step

9.3.1 Open the package to check.

Open the package, check every part of the unit is good or not, the accessories is complete or not. If any question, you can contact with the dealer or contact with our company. (Notice: when you open the package, should be careful, and please do not use the edge tool!!!)

9.3.2 Assemble the unit on the floor.

The floor should be smooth and strong. If the floor is not smooth enough, you can use four of the bolt M10*25 in the accessories box, crew them on the base of the unit to adjust the level of the unit.

9.3.3 Water and Air connection

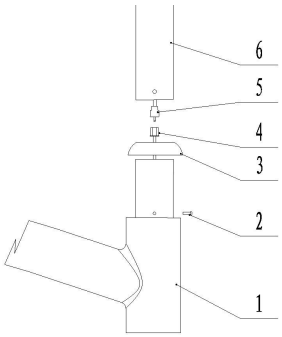
Connect the input water and air tubing: In the accessories box, there are two tubing connector(G1/2"), connect it to the input water tubing and input air tubing. Please be sure do not leak water and air. Before connect to the air and water supplier, please be sure that the air and water supplier tubing is clean.In the floor box, there are two tubing ∮8×5 (Blue is air tubing, crystal is water tubing), connect to the water and air supplier, Please be sure do not leak water and air.

Connect the drain water tubing: please be sure drain tubing work well, NO jam.

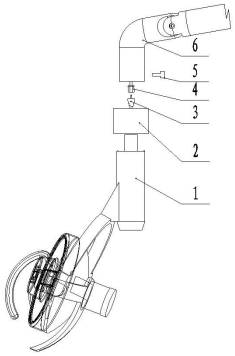
9.3.4 Operation light assemble.

9.3.4.1 Assemble the pole of the operation light (Picture 1): Screw out the M4 bolt"2", pull on the electric wire of the operation light arm to the pole, to "5" position, Connector "5" and connector "4" connect well. Then put the pole well. Screw back the M4 bolt"2".

9.3.4.2 Assemble the operation light(Picture 2): Take out the operation light from the box, and loose the bolt of the light, and connect the connector "3" and "4", And then connect the light to the arm, then screw the bolt to "5" hole to lock the light.



Picture 1



Picture 2

9.3.5 Assemble the cuspidor accessories part.

Put all the accessories well in the cuspidor.

9.3.6 Connect the plug well.

10、 **Maintain:**

10.1 Before do the maintain, please shut down the air, water and electric power.
10.2 Clean the filter of the cuspidor by water.
10.3 Clean the water filter by water at least per year. Or change the new one.
10.4 Handpiece should be done the maintain according to its demand.
10.5 It is better to close the operation light, if do not using.
10.6 After using the suction, it should be cleaned. The clean method: let the suction suck the clean water. And the filter of the suction should be clean at least two times per week. Take it out and clean by water.
10.7 Every movement part of the unit, it is better to spray the lube on it one time per 6 months.
10.8 Clean the Plastic cover with cloth, clean PU part with wet cloth. Other part clean with cloth without water.
10.9 When customer change the head of the suction or the three way syringe, it should be done according to the local law.

11、Fault analysis and solution.

Fault	Analysis	Solution
1.Handpiece do not have strong enough.	Check the tip of the handpiece	Change to the new one
	Check the bearing of the handpiece	Change to the new one
	Check the air pressure of the handpiec.	Adjust
	Check the handpiece tubing jam or not?	Clean
	Check the air filter	Clean
	If still have problem, please contact with dealer or the manufactory.	
2、There is no water to the handpiece	Check water adjust valve.	Adjust
	Check the micro switch for the handpiece on the instrument table.	Change to the new one
	Check the spray hole of the handpiece jam or not	Clean
	If still have problem, please contact with dealer or the manufactory.	
4、If do not use the handpiece, the handpeice leak water.	Check the electric valve of the handpiece in the instrument table, jam or not	Open the electric valve and clean.
	If still have problem, please contact with dealer or the manufactory.	
7、Instrument table can not be locked.	Check the air lock valve.	Change to the new one
8、Operation light do not work	Check bulb and the connector of the wire.	Change to the new bulb and repair the connector.
9、Heater do not work	Check the control PC board in the side box.	Repair the control PC board or change to the new one. If still problem, change the heater.
10、X-ray film veiwer do not work.	Check the electric power and the bulb in the light.	Change to the new one.