

Integral Dental Unit

Instruction Manual

File No.:HJ4-CE-82

Model: HJ-628A/B, HJ-638A/B, HJ-668A/B

Version: 00



Warning: Unauthorized modification of this equipment or its parts is not allowed.

CONTENT

1. GENERAL INTRODUCTION-----	2
2. CONSIDERATIONS-----	6
3. STRUCTURE DIAGRAM-----	8
4. TECHNICAL FEATURES-----	9
5. INSTALLATION-----	10
6. DEBUGGING-----	15
7. OPERATING INSTRUCTIONS-----	16
8. MAINTENANCE-----	22
9. TROUBLE-SHOOTING-----	24
10. ELECTRIC DIAGRAM-----	26
11. WATER AND AIR DIAGRAM-----	27
12. STORAGE AND TRANSPORTATION CONDITIONS, USAGE ENVIRONMENT AND LABELING INSTRUCTION-----	28
13. EMC DECLARATION OF DENTAL UNIT-----	29

1. General Introduction

Our integral dental unit is equipped with the most superior ergonomic solutions taking the needs of both doctors and patients into full account which has made a perfect presentation of the dental chair's functionality and comfort, allowing you to work in a healthy and relaxed state and making the treatment process become much easier.

Elegantly shaped and structured upholstery enables a comfortable sitting for the patient, and its seamless fabricated surface is easy to cleaned by health professionals.

Chair is driven by a pair of DC 24V electric motors, both seat and backrest position move smoothly and noiselessly.

Located beside the chair is side box unit, acting as a general junction for air, water and electric lines and valves. Built in side box also are a program controlled heater and a pure water bottle, by which hot water or distilled water could be an optional source during treatment.

Spittoon set is on top of side box unit, featured by its timely programmable cup water supply and flushing function.

Joined to the vertical lamp pole is the lamp arm, five-axis adjustment allowing lamp light to be cast from every convenient angle and distance.

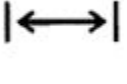
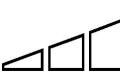
Horizontal rotate arm is built with pneumatic lock function. The lock button is placed at the table handle, with just one push along holding, table could be arranged smoothly to proper position, user-friendly and room-saving.

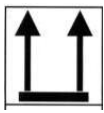
Besides electronic control panel on the table, attached to it also is a five-position tool holder, three for handpiece tubing installed, one for three-way syringe, and one for optional use.

Assistant control derives aside from side box unit, mainly connected to the built-in suction system. Attached to it is a tool holder, two for saliva suction inlet(one air-driven large volume inlet and one water-driven small volume inlet), one for three-way syringe, and one/two for optional use.

Symbols:

Figures and symbols	Descriptions	Figures and symbols	Descriptions
	Warning		Set key
	type B applied part		Reset position
	Protective earth (ground)		Dental unit, up
	CE marking in conformity with REGULATION (EU) 2017/745		Dental unit, down

	"ON" for part of the equipment		Dental unit, backrest backward
	"OFF" for part of the equipment		Dental unit, backrest forward
	Emergency Stop		Spittoon position Automatic reset
	Dental unit Automatic set		Dental unit Automatic set
	Dental operating light		Bowl flush
	X-ray Film viewer		Cup-filler
	Move to the limit of two ends pursuant to the line directions		Water heater
	inductive switch		Operating instructions
	Brightness		Caution: hot surface
	Indirect lighting		Lighting
	Low-intensity lighting		Variability, for rotating control (air/water adjustment of handpiece)
	Date of manufacture		Variability in steps
	Authorised representative in the European community		manufacturer
	Medical device		UDI number

Figures and symbols	Descriptions	Figures and symbols	Descriptions
IPX4	Protected against spraying liquid water		No tumbling
	Keep dry from rain		Temperature limit
	Humidity limitation		Atmospheric pressure limitation
	Fragile, handle with care		Keep away from sunlight
	Protect from heat and radioactive sources		Upward
	Prohibited stacking of 2		Stacking limit by mass of 350 kg
	Symbol for the marking of electrical and electronics devices according to Directive 2012/19/EU. The device, accessories and the packaging have to be disposed of waste correctly at the end of the usage. Please follow Local Ordinances or Regulations for disposal.		

Working principle:

Dental Unit is a combination of dental equipment components used to carry, position and control the devices used in the practice of dentistry.

Intended purpose

Dental Unit is an AC-powered device that intended to properly position a patient to perform dental procedures and supply power, water, or air to and serve as a base for other dental devices. And the Dental Unit is attached to a dental chair.

Population: adult.

Contraindications:

- 1) Patient weighed more than 150kg
- 2) Child patients
- 3) Hemophiliac.
- 4) Patients with cardiac pacemaker.

Side-effect:

The side-effects of Dental Unit are the noise, eye fatigue of the dental doctor by the dental light.

Clinical benefit:

Dental Unit is in universal used to position properly the patient in a comfortable position, supplies power and serves as a base for dental devices and accessories, for iatrical department to diagnose, cure and do operation. The Dental Unit is useful in the armamentarium of the modern dental practice in oral surgical field, the advantages of Dental Unit include make dentists' work as easy and safe as possible. They are highly adjustable and are equipped with adjacent dental equipment. The dentist has full control and can safely perform complex dental procedures like small scale dental surgery procedures. Dental Unit produced by Foshan Nanhai Hager Medical Machinery Co., Ltd can provide good clinical practice as for positioning properly the patient in a comfortable position, supplies power and serves as a base for dental devices and accessories, for iatrical department to diagnose, cure and do operation.

Intended user:

The user must meet the following requirements:

- a) Person Group and Occupation: Adult-qualified dentist and assistant
- b) Education:
 - At least 18 years old – 9 years intensive reading experience (school).
- c) Knowledge:
 - Read and understand 'westernized Arabic' numerals when written in Arial font.
 - Read this manual before use.
 - Understand stomatology.
 - Understand hygiene.
- d) Language understanding
 - Can understand English language in the User Manual and displayed on touch screen console.
- e) Permissible impairments:
 - Mild reading vision impairment or vision corrected to log MAR 0.5 (6/19 or 20/63)
- f) Experience:
 - Fully trained for the Dental Unit
 - Having experience using similar medical devices

Term of use life: 10 years

Contraindication and announcements:

Contraindication:



Forbidden for hemophiliac.



Forbidden for patients with cardiac pacemaker.



Caution in cardiac path, pregnant woman and children.

Announcements:

1. Ensure the equipment's outer power supply and grounding environment good and stable.
2. There's no component allowing customer's repairing on this equipment, and disassembling by the customers themselves are prohibited if faults occurred.
3. This equipment should be away from the environment with high temperature, high humidity, vibration, inflammable, out-of-balance and superfluous smoke during its operation.
4. There's no reach of any object within the equipment's working and moving scope.
5. Get rid of the water logging inside the air filtering reducing valve and clean or change the filter element immediately.
6. The dental chair should be descended to the lowest position during out of operation and turn off the general switch.
7. The equipment is prohibited to be used in condition of hidden dangers which are obvious or can be foreseen, and the dangers may cause damages to the patients or medical workers.
8. This equipment is not allowed to be used in the site with too strong electromagnetic radiation.
9. Personnel without professional training are not allowed to use this equipment to prevent wrong operation.
10. This machine has discontinuous operation.
11. This machine and its accessories should be declared worthless after its using life was expired according to the local laws and regulations.

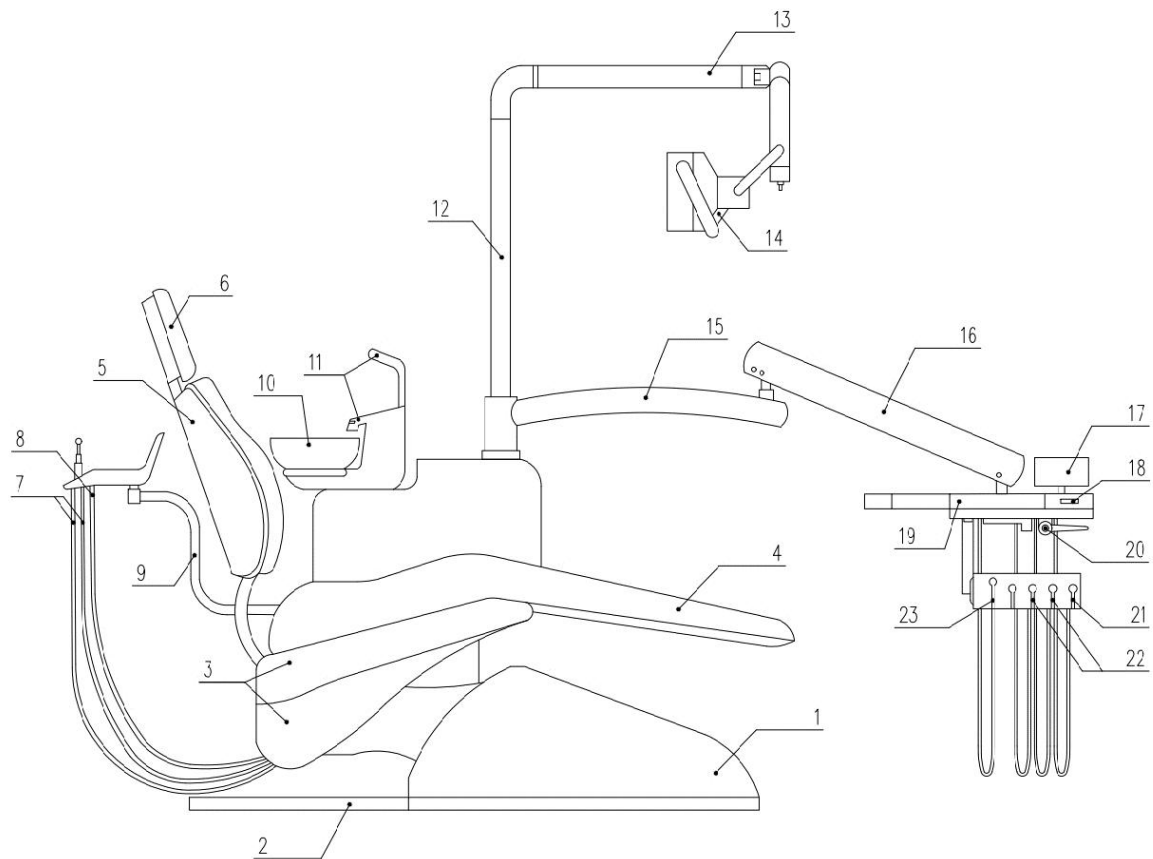
2. Considerations

1. The power cord must be configured as standard and the ground wire must be firmly connected.
2. Air supply pressure is 500kPa, water pressure is 200-400kPa.
3. Never turn on the heater switch when there is no water supply.

-
4. Do not stack heavy items on the tool tray.
 5. The working pressure of the pure water bottle of the treatment machine has been set. Non-professionals are not allowed to adjust it at will.
 6. Please turn off the water, gas and electricity switches when leaving get off work.
 7. The movement limit position of the dental chair has been locked. Non-professionals are not allowed to adjust it at will.
 8. When operating the dental chair, ensure that there are no accessible objects throughout the entire range of movement.
 9. Remove the accumulated water in the filter pressure reducing valve promptly.
 10. Clean or replace the water filter element promptly.
 11. When raising or lowering the dental chair with direct control, the control key must be kept pressed until the desired position is reached.
 12. After adjusting the position of the head frame, you must confirm that the head frame is locked before use.
 13. When replacing electrical components, the power supply must be cut off.
 14. When performing maintenance and cleaning on the machine, the power supply must be cut off first.
 15. This product is a fixed device after installation. Please do not move the product at will to prevent damage to the power cord, water inlet, air intake pipe and sewage pipe connected to the product. If you really need to move this product (such as renovating a clinic or changing a consulting room), please lower the dental chair to the lowest position, raise the backrest to the forward (upright) position, rotate the instrument arm and instrument tray above the dental chair, unplug the power cord, and remove the water inlet, air inlet pipe and sewage pipe connected to this product.
- Warning: When moving this product, be careful not to damage the power cord, water inlet pipe and sewage pipe. Please do not put force on the instrument arm and decorative cover. This must be done under the guidance of or by professionals licensed by Hager Company.
16. When using the comprehensive dental treatment machine, sterilize the dental drill handpiece, saliva suction head, scaler head, etc. that come into contact with the patient's mouth to avoid cross-infection.
 17. Untrained personnel are prohibited from using the dental treatment machine to avoid incorrect operation.
 18. Minors or patients with mental illness must be supervised by a dedicated person to prevent them from operating the dental treatment machine or falling from the dental treatment machine and causing injury.
 19. It is prohibited to use a dental unit if you know or should foresee that the unit may cause harm to the patient or health care staff.
 20. The operating pressure should not exceed 0.95MPa\135Psi\9.5bar

When equipment needs to be discarded or recycled, please comply with local laws and regulations for disposal.

3. Structure Diagram (for structural reference only)



1.	Front Cover	11.	Convenient Pole Set	21.	High Speed Handpiece Joint
2.	Bottom Cover	12.	Light Pole	22.	Three-way Syringe
3.	Frame Cover	13.	Light Arm	23.	Air Pressure Gauge
4.	Seat	14.	Dental Light	24.	Water Bottle
5.	Backrest	15.	Glass Tray	25.	Seat Handrail
6.	Headrest	16.	Horizontal Rotate Arm	26.	Light Handle
7.	Saliva Suction Inlets	17.	Film Viewer	27.	Main Table
8.	Three-way Syringe	18.	Control Panel	28.	Assistant Table
9.	Spittoon	19.	Main Table Handle with Air Lock Button		
10.	Cup Filling Nozzle & Spittoon Flushing Nozzle	20.	Low Speed Handpiece Joint		

Accessory

Name	Quantity
Fuse	2
3-ways Syringe Nozzle	4
Water Filter	1
4mm connector	2
Strong Suction Joint	1

Weak Suction Joint	1
Internal hexagonal screw	4

4. Technical features

Power Input: AC 230V 50Hz / 60Hz, $\pm 10\%$
850 VA

Fuse $\Phi 5\text{mm} \times 20\text{mm}$, F6.3A L250V

Stretching Range of the Headrest: 120mm

Backrest Movement Range: $80^\circ - 175^\circ$

Chair Load Capacity: $\leq 150\text{KG}$

Parts	Carrying capacity distribution (kg)
head and neck	11
upper torso and upper arms	50
Lower torso and forearms, thighs	61
calves and feet	28
Total	150

Air Exhaust Volume: $\geq 55\text{L} / \text{min}$

Input Air Pressure: $0.4 \sim 0.8\text{MPa}$,
The air flow rate during working $\geq 10\text{NI}/\text{min}$

Input Water Pressure: $0.2 \sim 0.4\text{MPa}$
The water flow rate during working $\geq 50\text{ml}/\text{min}$

Dental operating light power AC12V 55W

Dental Light Illumination Intensity 6000-42000LUX for LED

Dental Light Color Temperature 5000-6000K for LED

Thermostatic Water Heater 24V, 80-90W, Water Temperature: $40^\circ\text{C} \pm 5^\circ\text{C}$

Weak Saliva Ejector (weak suction): water suction pressure

Vacuum press is no less than 10Kpa when air pressure is 200Kpa,

Pumping speed is no less than 400 mL/min when water pressure is 200Kpa.

Strong Saliva Ejector (strong suction): air suction pressure

Vacuum press is no less than 25Kpa when air pressure is 400Kpa,

Pumping speed is no less than 1 L/min when water pressure is 400Kpa.

Drainage rate of Spittoon (Wastewater discharge) $> 5\text{L}/\text{min}$

Distance between the cleaning water outlet of the spittoon
and the overflow water level of the spittoon $\leq 75\text{mm}$

Starting force of the foot switch $\geq 11\text{N}$

Illumination of the film viewer $\geq 2000\text{cd}/\text{m}^2$

Technical parameters of water input, air, electricity and the working conditions should be:

Air Source: 0.55 Mpa ~ 0.8Mpa, air flow> 55 L/min
Air Humidity: Dew Point $\leq$ -20°C at Atmospheric Pressure
Air Oil Contamination: $\leq$ 0.5mg/m³
Air Particulate Contamination: $\leq$ 100 particle/m³ for 1µm to 5µm Particle Size

Water Source: 0.2 Mpa ~ 0.4Mpa, water flow> 10 L/min
Water Hardness Limit: <2.14 mmol/L (<12°dH))
Water PH Limit: 6.5 ~ 8.5
Max Water Particle Size: <100µm

Please note: Usage of water should be conformed to your local drinking water regulations, make sure good quality of drinking water before it is used through this machine.

Normal Working Environment Temperature: 5 ° C to 40 °C
Normal Working Relative Humidity: $\leq$ 80%
Normal Working Atmospheric pressure: 50kPa-106 kPa
The highest position of the patient chair from the ground $\geq$ 395mm
The lowest position of the patient chair from the ground $\leq$ 850mm
Lifting and moving distance of Instrument tray $\leq$ 450mm
Inclination of the panel of Instrument tray $\leq$ 180°
Inclination of the panel of Instrument tray $\leq$ 3°
Load capacity of instrument tray $\leq$ 4KG*
Load weight of Assistant tray $\leq$ 1KG
Work space 3000mm×2000mm
Overall dimensions of the dental chair: length (1885mm) × width (520mm) × height (1550mm)
Base plate size: length (820mm) × width (508mm)
Total weight of dental chair: about 221KG
Viewing light screen size: 13.5cm×6.5cm
Spittoon: solid filter mesh size $\leq$ 1mm

*: The maximum load capacity of the instrument tray refers to the load-bearing capacity for installing curing light, scaler, high- and low-speed handpieces, three-way syringe, etc.

5. Installation

5.1 Installation Condition

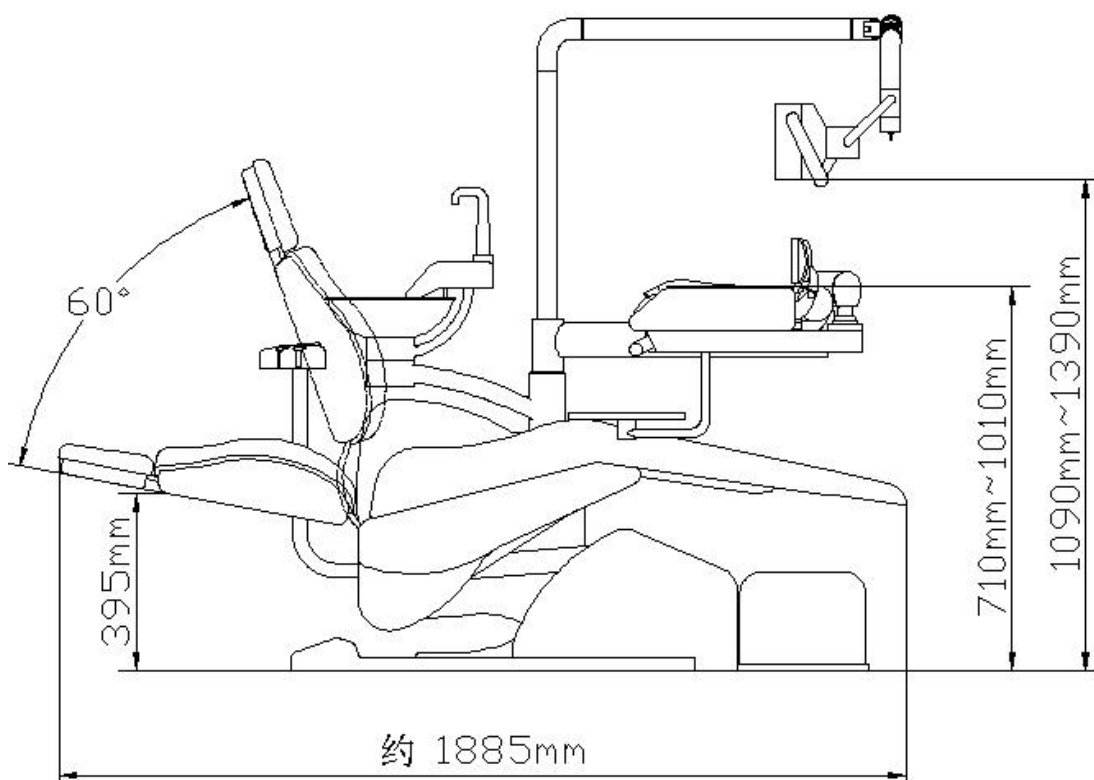
For the equipment's normal using, input the technical requirements of the equipment's air, water, electricity and environment as follows:

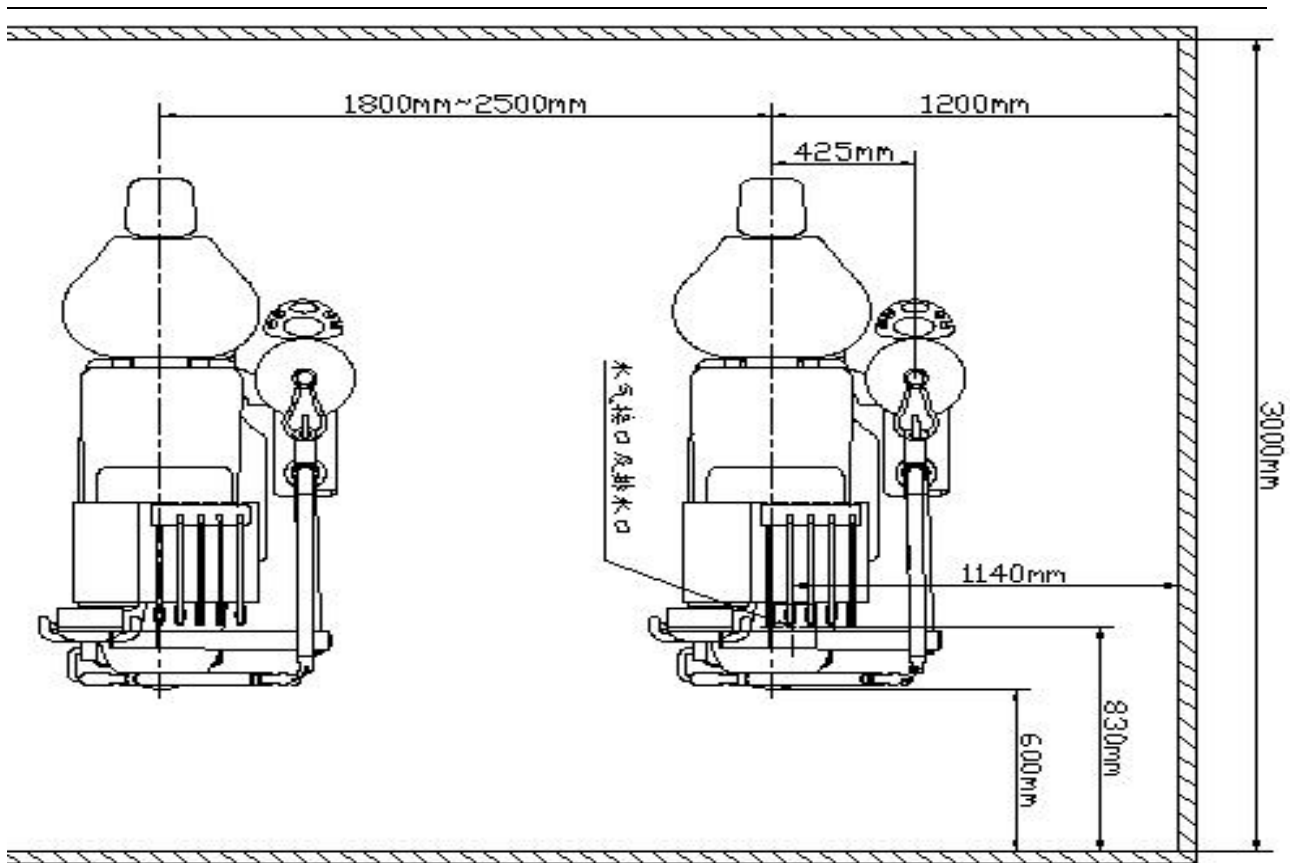
Air source: 0.5~0.8Mpa	Flow>55L/min
Oil pollution $\leq$ 0.1mg/m ³ ;	Dew point $\leq$ +3°C
Particle pollution limit (particles of 1 µm to 5 µm shall not exceed 100 particles/m ³), Air filter pore size: 40 µm	
Water source: 0.2~0.4Mpa	Flow>10L/min
Power: AC230±10V	50/60Hz 10A
Environment: temperature 5~40°C	Relative humidity no larger than 80%

5.2 Position Condition

Confirm the machine's installation position according to overall layout and lighting of the room, usage convenience and other specific conditions. This equipment should be located on a clean, dry and shade place with good ventilation. Guarantee the ground is flat, level and solid and closely contacted with the bottom metal plate of Dental Unit. This location should ensure the Dental Unit is out of reach of any object during the whole moving process.

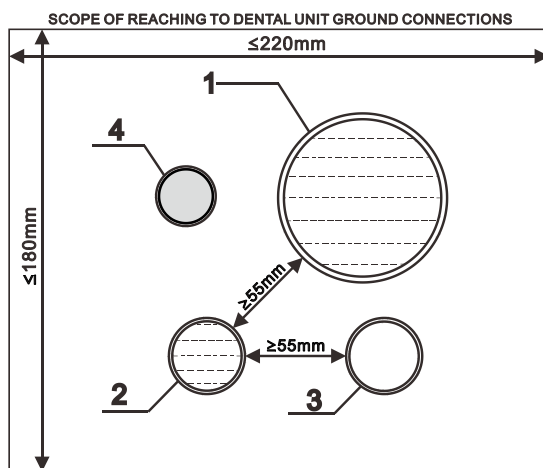
Dental Unit Installation Instruction



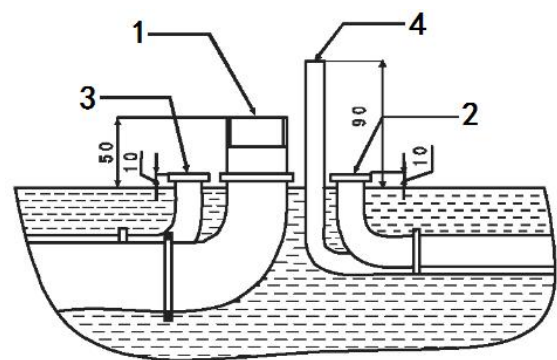


2

5.3 Ground Pipeline Condition



Ground Pipeline Connection Diagram-1



Ground Pipeline Connection Diagram-2

1. Drainage Pipe 2. Water Intake Pipe 3. Air Intake Pipe 4. Electric Wire Pipe

5.3.2 Confirm the underground water, air and electricity hidden pipes' position referring to the "Ground Pipeline Connection Diagram-1 &2" above, and then bury and set them well

 Warning: During burying the drain-pipe, the pipeline should have gradient for smooth drainage.

- Both Water Inlet and Air Inlet tube adopted are 22mm in external diameter (ZG1/2"), and are connected through bend with the height about 10mm over the ground (internal thread should be contained inside the bend ZG1/2").
- Drainage pipe adopts the pipe which inner diameter should be larger than 48mm (ZG 1 1/2").
- Electric wire pipe should tower above the ground about 90mm, connected to dental unit plug.
- Ground pipeline should be within an area of 220*180mm reaching dental unit connection.

5.4 Installation steps

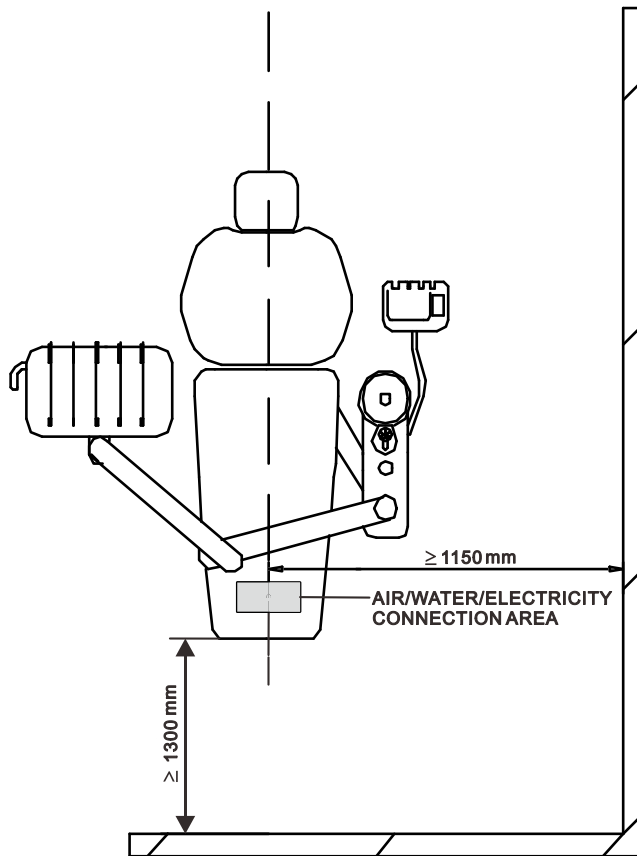
5.4.1 Accessories for Installation

Take out accessories from dental unit package, including:

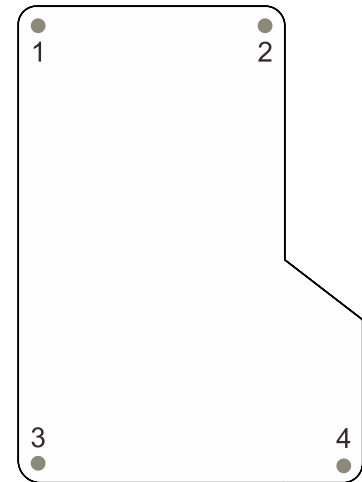
- Balance Screw: $\phi 12\text{mm}$, 4pcs, to fix at 4 corners of bottom plate.
- Adapter Screw: 22mm(ZG1/2") to 8*5mm, 2pcs, to connect water and air inlets.

5.4.2 Installation of Dental Chair

- Disassemble the front cover component(referring to **Structure Diagram - 1**) first.
- Set Dental Chair on the reserved position, referring to below Reserved Position Diagram. Make sure air/water/electricity connected within scope of ground pipelines.
- Drill the balance screws into the $\phi 12\text{mm}$ holes at 4 corners of bottom metal plate, referring to below Bottom Metal Plate Diagram.



Reserved Position Diagram

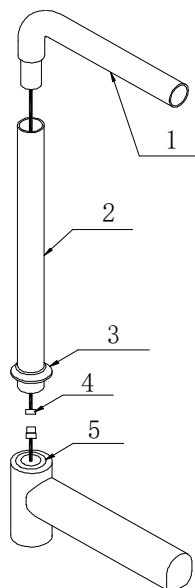


Bottom Metal Plate Diagram

- Adjust the 4 balance screws until chair stands stably on the ground without shaking at the bottom, then the chair is fixed. *Please note: Drill off the 4 balance screws before any position change.
- Put the front cover and the bottom cover to the original position, and then fix them well.

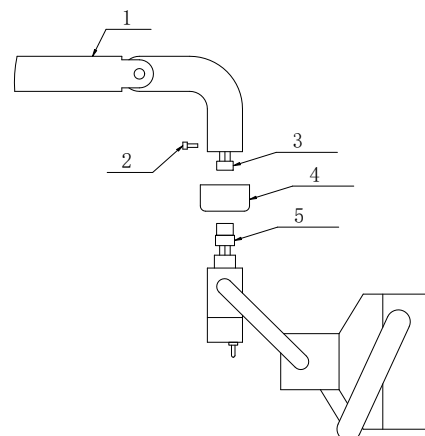
5.4.3 Installation of Lamp

Open package of light pole and Dental Light, install referring to below diagram:



Installation of Light Pole

1. Light Arm 2. Light Pole 3. Ornament Ring
4. Wire Connection A 5. Pole Base



Installation of Dental Light

1. Light Arm 2. Screw 3. Wire Connection B
4. Ornament Ring 5. Dental Light Connection

Pass wire through the light arm and light pole. Connect one end of the wire (Connection A) to pole base, connect light pole to pole base at the bottom and light arm on top, while passing through the ornament ring. Connect the other end of the wire (Connection B) to Dental Light connection, joint the light arm and light together with an attached screw, while passing through the ornament ring.

5.4.4 Installation of Ground Pipelines Connections

Before connecting pipelines, discharge the dirt and impurities from water and air source first, then fix water and air source outlets through adapters(ZG1/2" to 8*5mm), respectively to dental unit's water and air inlet tubes, as following:

- Water Inlet Tube: $\phi 8 \times 5 \text{mm}$, color transparent, PU tube*1pc
- Air Inlet in Tube: $\phi 8 \times 5 \text{mm}$, color blue, PU tube*1pc

Fill the machine's waste water tubes into ground drainage pipe inlet and pay attention to tube stability, below are specifications of 3 waste water tubes from dental unit:

- Suction outlets: $\phi 17 \times 13 \text{mm}$, color transparent, PVC tube(steel wire coated)*2pc
- Spittoon water outlet: $\phi 17 \times 13 \text{mm}$, color transparent, PVC tube(steel wire coated)*1pc

To enable smooth waste flow, minimum gradient of waster water tubes should be at least 45° from horizontal line while joining to drainage pipe lines.

And then connect electricity plug to electric source at ground pipelines.

If you need to connect an amalgam separator, install a "multi-pass" plastic part at the end of the drainage pipe of the dental comprehensive treatment machine. You can combine the three drainage pipes into one large drainage pipe and then connect the amalgam separator. The Yingong alloy separator used must meet the requirements of ISO11143: $\geq 95\%$. This connector needs to be purchased by the user.

6. Debugging

- 6.1 Turn on air source and check the gauge of air pressure reducing valve in front cover (or on ground box if installed), which value should be 0.55~0.6Mpa, otherwise the air pressure reducing valve needs to be adjusted until the value becomes normal (exact method is to open the front cover, pull the valve knob, turn clockwise/anti-clock wise to change value, after adjustment push the knob back to fix.)
- 6.2 Make sure outer water source is clean and pressure to be 0.2~0.4Mpa (lower than this value weak suction will malfunction as its pressure is water-driven.) To use bottle water for handpiece and three-way syringe, turn on both water source switch and air pressure switch on top.
- 6.3 Connect the plug to electricity supply and turn on general switch on chair back (or on ground box if installed), the equipment will generate a single "Bi---" buzz.
- 6.4 Turn on Dental Light and observe whether the lighting is normal or not, referring to instruction 6.2.
- 6.5 Switch on film viewer (and press control button on main control panel if has) and observe whether the back light panel is normal or not.
- 6.6 Lift up handpiece joints from the holder separately and step on pedal air switch to discharge residue inside the pipelines. Connect handpieces well in accordance with their operating instruction and

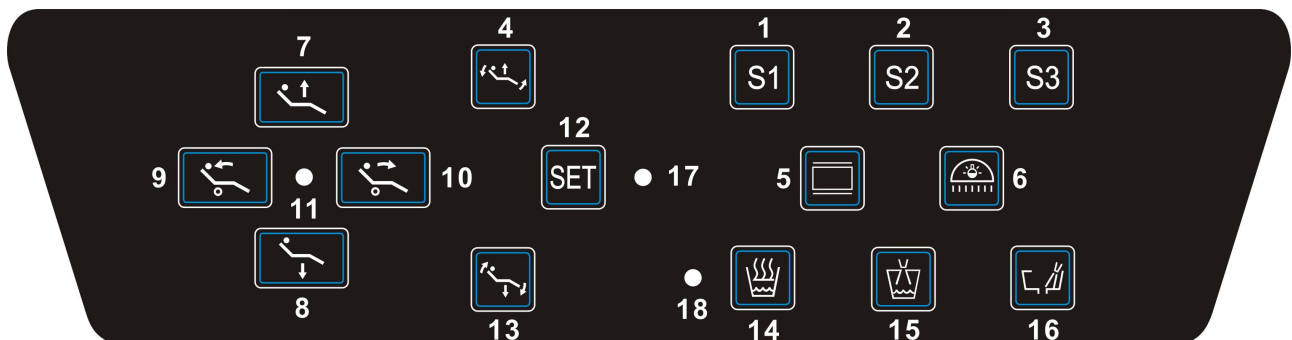
adjust each air and water pressure by adjustment switches attached at main table, referring to instruction 6.4.

- 6.7 Lift up three way syringe and discharge residue inside the pipelines. There are two push buttons on it, one to eject air, one to eject water, or both together to atomize.
- 6.8 Press cup filling and Spittoon flushing keys on main control panel to check whether the water flow is normal or not and set their water supply amount according to instruction 6.
- 6.9 Check saliva suction system by putting each suction head separately into a cup of clean water and observe if the absorption is smoothly. (Make sure suction filter joint is tight without air leakage when installed.)
- 6.10 Fill in water bottle with less than 600ml pure water and fit it closely back to the joint. Then turn on both source switch and pressure switch (referring to instruction 6.5) to see if handpiece and three-way syringe are well supplied with bottle water. While detaching bottle to refill water, make sure to turn pressure switch off first.

7. Operating Instructions

7.1 Control Panel Operation Instruction

Marks of control keys on the main and assistant control table are shown as following diagram:



1. Memory Position 1
2. Memory Position 2
3. Memory Position 3

***The upper control panel operation is for model HJ-628A/B, HJ-668A/B with position saving(memory) function.**

One press on either of these keys, chair will move to according memory position.

4. Preparation Position Key

When chair reach the limit of reset position, press this key to move dental chair to middle high position to prepare further operation.

5. Film Viewer Key

General on/off switch for film viewer.

6. Dental Light Key

General on/off switch for Dental Light.

7. Chair Upward Key

8. Chair Downward Key

9. Backrest Backward Key

10. Backrest Forward Key

Long press one of these direction movement keys to move chair toward corresponding direction, and release to stop the movement when it come to intended position. If the key is pressed and held, the chair will move continuously until it reach the limit.

11. Power indicator light

Connect the power and the power indicator light will be on; Cut off power, the power indicator light goes off.

12. SET Key

Used together with other function keys to complete relating setting, referring to Key 1,2,3,15,16

13. Reset Position Key

At any position, press this key to move chair to initial position: the chair will go to the lowest position, the backrest will lean forward to let patient off from seat.

14. Water Heating Key

Press to start water heater, heating indication light will flicker during heating and stay on after heating completed. Press again to stop heating, heating indication light turns off.

15. Cup Filling Key

Press to supply water to cup, press again to stop. Water supply amount can be preset as below:

- Long press SET Key 3~4s until the SET indicating light is on.
- Long press Cup Filling key to start water supply, when the water amount is due, release the key.
- Press SET key again to complete setting.

16. Spittoon Flushing Key

Press this key to flush the cuspidor, press again to stop flushing or until it stops. Flushing amount can be preset as below:

- Long press SET Key 3~4s until the SET indication light is on, then short press Flushing key to change flushing time.
- SET indication light flicks 1 time, meaning flushing time 30min; SET indication light flicks 2 times, meaning flushing time 60min; SET indication light flicks 3 times, meaning flushing time Maximum; SET indication light flicks 4 times, meaning flushing time 12s.
- Press SET key again to choose flushing time and complete setting.

17. Setting indicator light

18. Heating indicator light

Memory position can be preset as below:

- *Long press SET key and release till the setting indicating light is on.*
- *Adjust the chair to intended position by operating on movement keys.*
- *Press any one of S1/S2/S3 to save the current chair position to an according key.*
- *Press SET key again to turn off indicating light and complete setting.*

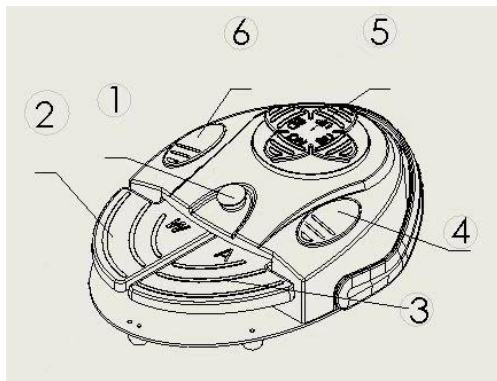
❖ *Program Reset for Movement Malfunction*

When any 1 or 2 of the 4 movement directions malfunction, it could be program error of the memory system, in this case program reset is necessary, according to reset process below:

- *Long press SET key on main table side for 1 Minute. In between it will be "beep-beep" sound but do not release the key, until chair starts to move.*
- *Release SET key when chair start to adjust position automatically.*
- *After movement stops, long press SET key 3s~4s to complete setting til SET indication light is off.*

7.2 Pedal Operation Instruction

Below is diagram for multi-function pedal switch:



1. Handpiece Air Blowing Button

Step on to discharge water/air remains from handpiece tubing.

2. Water Controller for Handpiece

3. Air Controller for Handpiece

Lift handpiece from shelf holder, step on each of the button 2/3 to turn on water or air supply respectively, or on both to turn on water and air supply together.

4. Spittoon Flushing Button

Step on to turn on Spittoon flushing.

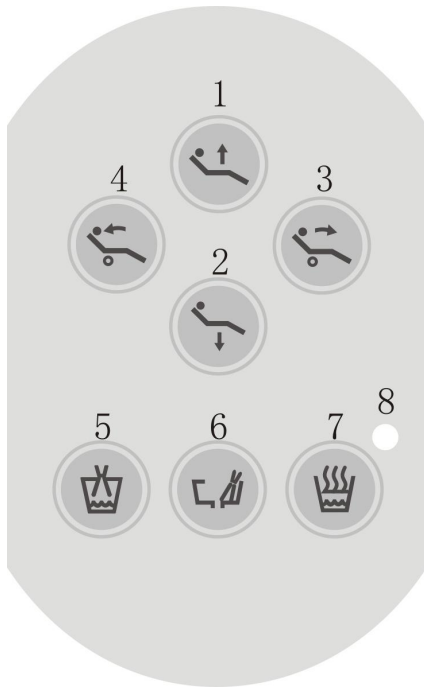
5. Chair Movement Switch

Step on top and push the switch up/down/left/right to turn chair seat up/down, backrest backward/forwarder respectively.

6. Cup Water Filling Button

Step on to turn on water filling to cup.

7.3 Assistant Control Panel Operation Instruction

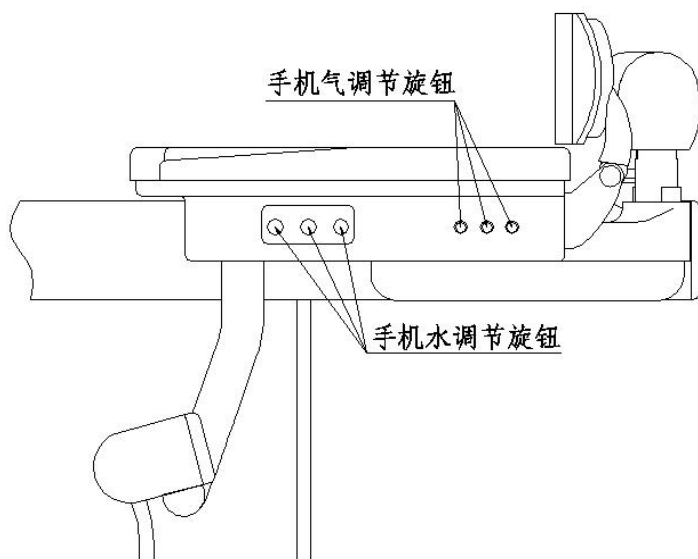


The assistant control panel is installed on the assistant side of the dental unit, with keys 1, 2, 3, 4, 5, 6, 7, and 8 for chair movement upward, downward, backrest forward, backrest backward, water supply, spittoon flushing, and heating. The instructions of the above keys are the same as those on the main control panel of the dental unit.

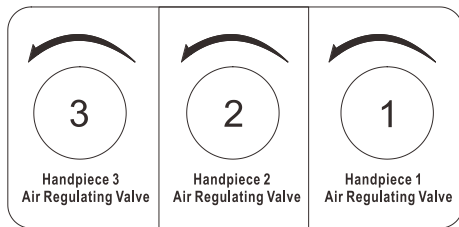
7.4 Handpiece Adjustment Operation Instruction

There are 2 parts of adjustment for handpiece source, one for air supply and one for water supply. Adjustment valves are located on bottom (or right side) of main control table.

7.4.1 Air Regulating Marks, as below:



The air and water regulating location



1. Air Regulating for Handpiece1

Handpiece1 is on the left side of the total three handpieces. Facing the marks, turn the valve clockwise to minimize handpiece air volume, turn anti-clockwise to maximize.

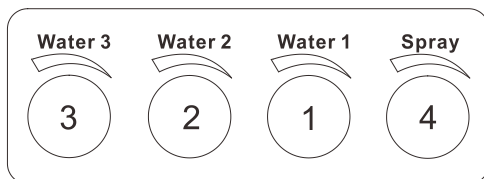
2. Air Regulating for Handpiece2

Handpiece2 is in the middle of the total three handpieces. Facing the marks, turn the valve clockwise to minimize handpiece air volume, turn anti-clockwise to maximize.

3. Air Regulating for Handpiece3

Handpiece3 is on the right side of the total three handpieces. Facing the marks, turn the valve clockwise to minimize handpiece air volume, turn anti-clockwise to maximize.

7.4.2 Water Regulating Marks, as below:



1. Water Regulating for Handpiece1

Handpiece1 is on the left side of the total three handpieces. Facing the marks, turn the valve clockwise to minimize handpiece water volume, turn anti-clockwise to maximize.

2. Water Regulating for Handpiece2

Handpiece2 is in the middle of the total three handpieces. Facing the marks, turn the valve clockwise to minimize handpiece water volume, turn anti-clockwise to maximize.

3. Water Regulating for Handpiece3

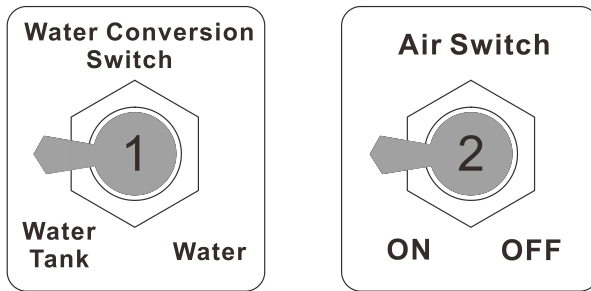
Handpiece3 is on the right side of the total three handpieces. Facing the marks, turn the valve clockwise to minimize handpiece water volume, turn anti-clockwise to maximize.

4. General Spray Adjustment

Facing the marks, turn the valve anti-clockwise to atomize handpiece water, turn clockwise recover.

7.5 Water Bottle Operation Instruction

Water bottle control switches are located above water bottle, below is the diagram:



1. Water Conversion Switch

Flip the switch left to change handpiece and 3-way syringe water source from outer water to bottle water, flip right to change back.

2. Air Pressure Switch

Flip the switch left to pressurize bottle water as supply source, flip right to close the function.

* Please note: Only when both switches for water and air are turned on could bottle water be used.

7.6 Dental Light Control



The LED Dental Light(sensor control) please refer to the following:

1. Stay an object under the sensor to change lighting brightness.
2. Sway an object facing the sensor to turn light off/on.

7.7 General Switch

General air switch is set on the chair back or ground box(if installed) to turn on/off air, water and electricity supply. Please turn the switch off before cutting out power supply.

8. Maintenance

Daily maintenance shall keep the equipment clean, the pipeline smooth and removal of leakage and infuse lubricating oil on the turning parts timely to ensure the equipment is in good condition.

8.1 Air Filter Maintenance

In order to ensure stable, clean, and dry gas pressure input into this device, there is an air filter pressure reducing valve installed at the lower inlet of the front cover of this device. The filtered water will accumulate and settle in the filter cup, which will affect the filtration effect over time.

In general, if one of the following situations occurs, the air filter pressure reducing valve should be drained. (Loosen the knob at the bottom of the filter cup to discharge it)

- 1) Used for more than a week.
- 2) The volume of water in the filter cup should be more than 3/4 (including 3/4).
- 3) The water in the filter cup changes color.

The filter element should be cleaned once a month. If the filter element is removed, it should be cleaned with an ultrasonic cleaner or a neutral detergent.

8.2 Water Filter Maintenance

Water filter is set at the water-inlet position to block impurities inside water from entering the equipment tubing. After it is used for a certain time, dirt particles will accumulate up and block the water flow, normally it will be necessary to recover the function through cleaning or changing the filter element at below conditions:

- Over one year using.
- Pressure lost of the filter element is over 0.1Mpa.
- The filter element is polluted.
- Water supply is getting muddy.

Methods for cleaning or changing of the filter element are:

- Cut off power and water supplies.
- Turn anti-clockwise to open the plastic cup on water filter.
- Release the screw in the middle of the filter net, unpick filter element; clean it or change it.
- Install back the filter element and seal the plastic cup well without overexerting.

8.3 Chair Surface Clean and Maintenance

- Protect surface of the chair upholstery from scratch by sharp items. Cleaning on surface is needed regularly, medical alcohol can be used to wipe, clean and sterilize the surface. Application of cloth cover is a useful way to prevent upholstery from wearing out.
- Saliva and watering nozzles need to be wiped, cleaned and sterilized by medical alcohol regularly.
- Nozzles of three-way syringe could be detached off by pushing at the junction, sterilize them in autoclave after using.

-
- Seat handrails and light handles need to be wiped, cleaned by medical alcohol regularly.
 - Surface of main and assistant table should be wiped, cleaned by medical alcohol regularly.
 - The dental chair is intermittent working system, it needs to rest 18 mins after working 2 mins.
 - It is recommended to wipe and clean the strong and weak suction saliva dispensers with medical alcohol after each use. The three-way syringe nozzle is recommended to be disinfected for no less than 4 minutes in an environment of 134 °C, 220kP, and 80% RH after each use

8.4 Tubes Disinfection

Keep the water tank empty and switch the air pressure switch to "positive pressure" to discharge waste and water from the pipeline.

Switch the air pressure switch to the "depressurized" position. Remove the white distilled water tank and install a disinfectant filled disinfection water tank.

Switch the air pressure lever to "positive pressure" and operate the dental instruments one by one until the disinfectant sprays out and lasts for a few seconds. Keep the device in a non-working state for one to two hours.

Switch the air pressure lever to the "pressure reducing" position, remove the disinfection water tank, and reinstall the white distillation water tank. Switch the air pressure rod again and clean the internal water pipeline in the same way.

It is recommended to use hypochlorous acid disinfectant and purified water diluted in a 1:4 ratio as a disinfectant, disinfecting once a day.

After approximately 1900 times disinfection, the pipeline must be replaced. If there are any issues with the appearance of the pipeline, please contact the manufacturer for timely replacement.

8.5 Cleaning and sterilization of 3-way syringe

Sterilization: Sterilization of the 3-way syringe nozzle in this product syringe: it can be cleaning and Sterilized as following method:

Syringe nozzle cleaning

1) Rinsing Using daily drinking water rinsing with a brush, removal of organic residues on the 3-way Syringe. then perform disinfectant soaking.

2) Disinfectant soaking

Disinfectant: Medical alcohol.

Put the rinsed devices on medical utensils, Pour into medical alcohol, the 3-way Syringe nozzle. should be submerged medical alcohol, soak for 10 minutes, then scrub the surface of the 3-way Syringe nozzle with the brush. in the end perform end rinsing.

3)End rinsing with purified water or distilled water to flush, Clean the residual alcohol. Since then, it can be used to sterilization.

The 3-way Syringe nozzle has to clean after each use.

The Maximum clean times: 250

Syringe nozzle sterilization

1)Syringe loading: Put 3-way Syringe nozzle samples into heat-sealing sterilization pouches. The 3-way Syringe nozzle were placed in trays, then transferred to sterilizer cavity.

2)Moist heat sterilization:

Sterilization temperature: 134°C.

Sterilization time: 6 minutes.

Drying time: 15 minutes.

Pressure: 2.1 bar.

The Syringe has to sterilization after each use.

The Maximum sterilization times:250

The detailed sterilization method of dental handpieces shall be implemented according to the manufacturer's instructions

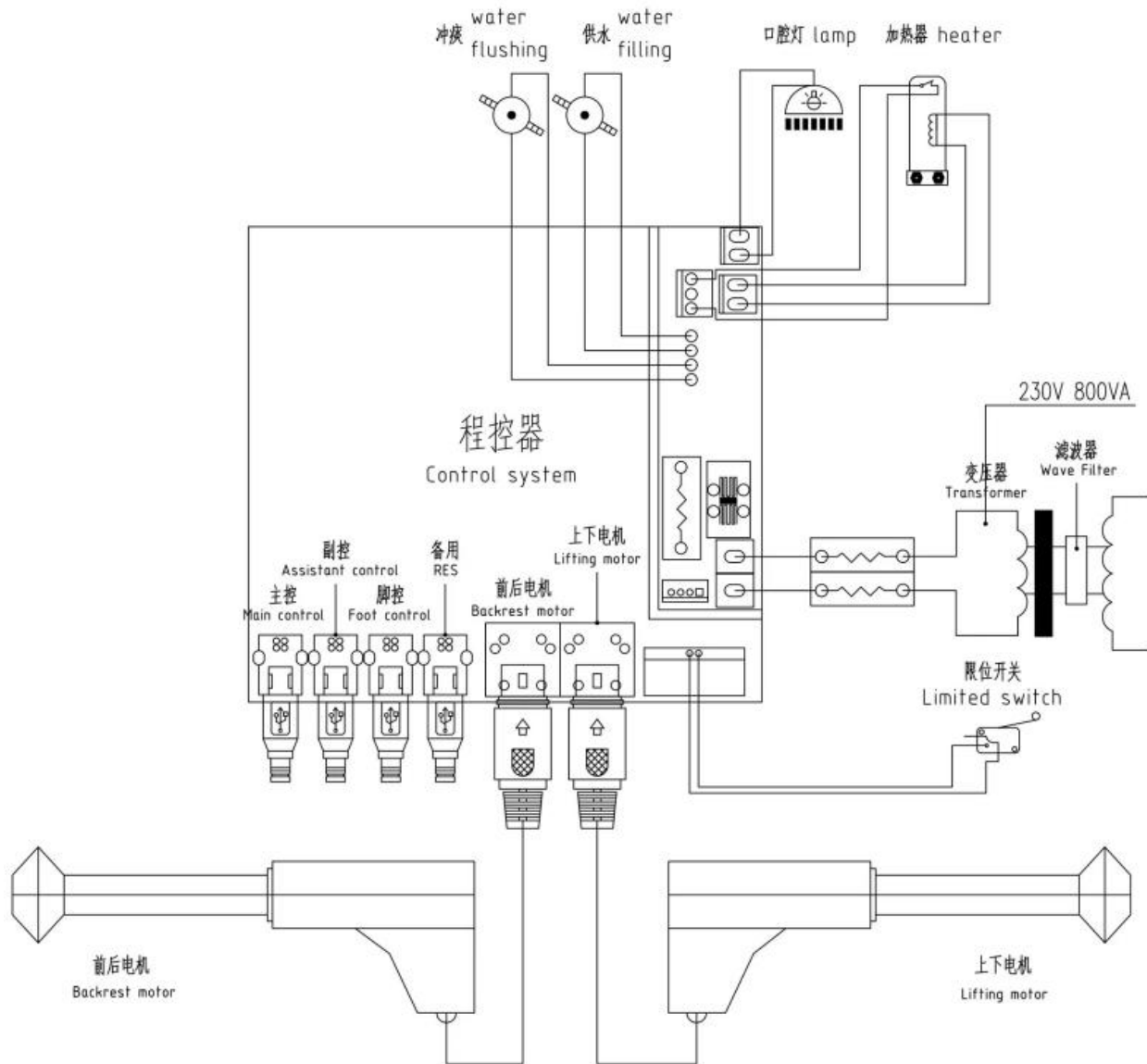
- 8.6 If the dental chair is not used for a long time, the water in the dental chair water tubes can be drained to keep the water tubes dry, thereby preventing the long-term growth of a large number of bacteria and the formation of biofilms in batches; The specific operation method is to empty the water bottle, pick up each handpiece tube one by one, turn on the cooling water switch to the maximum, and then step on the foot for more than 20 seconds to achieve the emptying and drying of the pipeline. When the dental chair is used again, inject disinfectant for disinfection and then inject clean water for treatment.

9. Trouble-shooting

TROUBLE	CAUSE	SOLUTION
Machine not working	1. Power supply not connected	Connect power supply
	2. Power supply fuse blown	Replace the blown fuse
	3. Machine fuse blown	Replace the blown fuse
	4. Control box poor connection	Adjust the connection
	5. General control switch is off	Turn on the switch
Chair motor not working	1. Motor wire connection failure	Adjust the wire connection
	2. Control panel key malfunction	Replace the panel keyboard
	3. Control box broken	Replace the control box
	4. Motor broken	Replace the motor
	5. Memory position function disorder	Reset memory program following instruction
Dental Light not working	1. Light bulb burnt out	Replace the bulb
	2. Poor contact of light to light arm	Adjust the contact
	3. Poor contact of light pole to the base	Adjust the contact
	4. Transformer fuse blown	Replace the blown fuse
Spittoon flushing and cup filling water cannot be turned off	1. Obstacles inside the solenoid valve	Clean up the valve
	2. Side box PCB malfunction	Replace the PCB
No water from spittoon flushing and cup filling nozzles	1. Water tubing twisted	Adjust or replace related tubing
	2. Solenoid valve burnt out	Replace the solenoid valve
	3. Side box PCB malfunction	Replace the PCB
Poor drainage of the spittoon	1. Pipeline blockage	Clean up waste in the pipeline
	2. Drainage tube squeeze	Adjust the tube

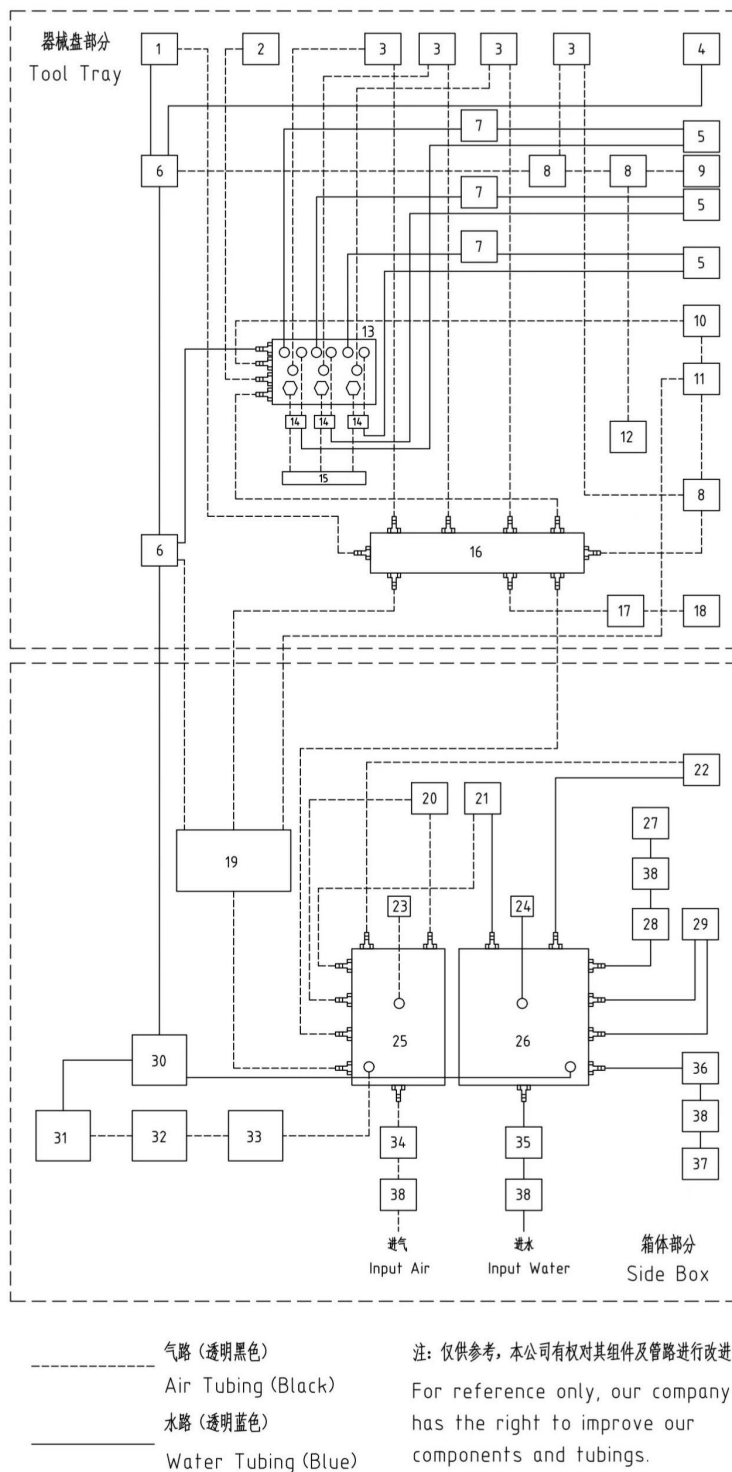
Water leakage from idling hand-piece	1. Handpiece joint not connected well	Adjust the connection
	2. Air control of the pedal switch not reset	Release the air control switch
No water supply for working handpiece	1. Water pressure too low	Adjust the water pressure
	2. Water adjustment valve turns off	Turn on water adjustment valve
	3. Water switch is off - when using bottle	Turn on water supply switch
	4. Air pressure is off - when using bottle	Turn on air pressure switch
Poor suction or no suction effect	1. Waste blockage inside the suction tube	Clean the waste or replace tube
	2. Waste blockage inside the filter cup	Clean up the filter cup
	3. Air Leakage at filter or tubing joint	Seal the connection well
	4. No air pressure at the holder valve	Adjust the holder valve
	5. Low air or water pressure	Adjust air or water pressure

10. Electrical connection diagram



电气原理图/Electrical schematic diagram

11. Water and air connection



水气原理图

Schematic diagram of air and water

Explanatory note on water and air connection diagram:

1. Cold water three way syringe 2. Air pressure meter 3. Holder Switch 4. Scaler 5. Water adjustment 6. Water Valve 7. One direction valve 8. Three-Direction Tube 9. Air-Electric Valve(Scaler) 10. Water atomization 11. Shunt Valve 12. Air-Electric Valve(Interlock switch) 13. 3

in 1. Diaphragm Valve 14. High and low speed handpiece tubing 15. Return air bottle 16. Multi-Direction Valve 17. Air lock switch 18. Brake valve 19. Foot pedal switch 20. Strong suction holder switch 21. Weak suction holder switch 22. Hot water three way syringe 23. Strong suction valve(Strong suction tubes) 24. Strong suction valve(Weak suction tubes) 25. Collection Valve(Air) 26. Collection Valve(Water) 27. Drainage Hose 28. Saliva Solenoid Valve 29. Water heater 30. Water switch 31. Pure water bottle 32. Pure water bottle switch 33. Simple filter 34. Air Filter 35. Water Filter 36. Flushing Solenoid Valve 37. Flushing Tubes 38. One direction valve

12. Storage and transportation conditions, usage environment and labeling instruction

1. Transportation environment

Transportation is carried out according to the order contract.

1. Storage environment

The packaged treatment machine should be stored at an ambient temperature of -40°C to +50°C, a relative humidity of ≤93%, and an atmospheric pressure of 50kPa-106 kPa.

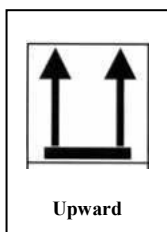
No corrosive gases and a well-ventilated, clean room.

2. Usage environment

Ambient temperature: 5°C~40°C Relative humidity: ≤80%

Atmospheric pressure: 50kPa-106 kPa

3. The packaging wooden boxes are spray-painted with signs such as "Fragile Items", "Upward" and "Afraid of Rain".



4. Logo description

The device nameplate is marked with the following symbols:

Pay attention to the documentation that comes with your device 

Electrical safety protection mark: Type B 

IPX4 foot switch waterproof rating: drip-proof type

Products comply with WEEE directive 

13. EMC Declaration of Dental Unit

1 WARNING: Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.”*

2 WARNING: Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.”*

3 WARNING: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the ME equipment, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.”*

Table 1

declaration - electromagnetic emission	
Emissions test	Compliance
RF emissionsCISPR 11	Group 1
RF emissionsCISPR 11	Class A
Harmonic emissionsIEC 61000-3-2	Class A
Voltage fluctuations/flicker emissionsIEC 61000-3-3	Complies

Table 2

declaration - electromagnetic immunity		
Immunity test	IEC 60601 test level	Compliance level
Electrostatic discharge (ESD) IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines
Surge IEC 61000-4-5	± 0.5 kV, ± 1 kV line(s) to lines ± 0.5 kV, ± 1 kV, ± 2 kV line(s) to earth	± 0.5 kV, ± 1 kV line(s) to lines ± 0.5 kV, ± 1 kV, ± 2 kV line(s) to earth
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0 % UT; 0.5 cycle At 0°, 5°, 90°, 135°, 180°, 225°, 270° and 315° 0 % UT; 1 cycle and 70 % UT Single phase: at 0° 0 % UT; 250/300 cycles	0 % UT; 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0 % UT; 1 cycle and 70 % UT; 25/30 cycles Single phase: at 0° 0 % UT; 250/300 cycles
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m
NOTE: UT is the a.c. mains voltage prior to application of the test level.		

Table 3

declaration - electromagnetic immunity		
Immunity test	IEC 60601 test level	Compliance level
Conducted RF IEC 61000-4-6	3V 0.15 MHz to 80 MHz 6 V in ISM bands between 0.15 MHz and 80 MHz	3V 0.15 MHz to 80 MHz 6 V in ISM bands between 0.15 MHz and 80 MHz
Radiated RF IEC 61000-4-3	3V/m 80 MHz to 2.7 GHz	3V/m

Table 4

declaration - IMMUNITY to proximity fields from RF wireless communications equipment					
Immunity test	IEC60601 test level				Compliance level
	Test frequency	Modulation	Maximum power	Immunity level	
Radiated RFIEC61 000-4-3	385 MHz	**Pulse Modulation:18Hz	1.8W	27V/m	27 V/m
	450 MHz	*FM+ 5Hz deviation: 1kHz sine	2 W	28V/m	28 V/m
	710 MHz 745 MHz 780 MHz	**Pulse Modulation: 217Hz	0.2 W	9V/m	9 V/m
	810 MHz 870 MHz 930 MHz	**Pulse Modulation: 18Hz	2 W	28 V/m	28 V/m
	1720 MHz 1845 MHz 1970 MHz	**Pulse Modulation: 217Hz	2 W	28 V/m	28 V/m
	2450 MHz	**Pulse Modulation: 217Hz	2 W	28 V/m	28 V/m
	5240 MHz 5500 MHz 5785 MHz	**Pulse Modulation: 217Hz	0.2 W	9 V/m	9 V/m
Note* - As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case. Note**- The carrier shall be modulated using a 50 % duty cycle square wave signal.					



Foshan Nanhai Hager Medical Machinery Co., Ltd

Add.: F3, No.222 Lijia Industrial Area, Shang'ancun, Qiaojin, Danzao Town, Nanhai District, Foshan City, Guangdong, China

Tel: +86(757)86402466

Fax: +86(757)86402466

E-mail: keith@fs-hager.com

Document no.: HJ-CE-82

Version: 00

Date: 2024.6.12

Software version: V1.0



Official EU representative:

Wellkang Ltd

Address: Enterprise Hub, NW Business Complex, 1 Beraghmore Road, Derry, BT48 8SE, Northern Ireland

