

# Product manual

## High-Frequency portable dental X-ray unit



# Product manual

**Dear users:**

**Welcome you to choose our company's products, our company adopts advanced high frequency doubler and color touch display technology, to create a new generation of high frequency portable high definition X-ray unit. Design more human nature, operation more convenient, model conversion more precise and digital imaging more clearly.**

**Before use, please you first pay attention to check the product model and production serial number. If there is any omission, deviation or malfunction in the later use process, please contact the local dealer or our company, and inform the product models and production serial number.**

**Model: \_\_\_\_\_ Serial NO.: \_\_\_\_\_**

- ◆ Before using this equipment, please read this manual carefully all of the safety and operation hints.**
- ◆ When using this equipment, please in strict accordance with the operational procedures, proper maintenance and service.**
- ◆ Please keep this manual and the attached warranty card, future reference and warranty will be used.**
- ◆ If this equipment is in use process malfunction, please contact the local dealer or our company, we will provide you with quality service, to help you solve the problem in time.**

## Catalog

1. Summary
  - 1.1 Product usage
  - 1.2 Structural components
  - 1.3 Electrical classification
  - 1.4 Product features
  - 1.5 Debug instructions
  - 1.6 User instructions
  - 1.7 Warning and attention
2. Technical parameters
  - 2.1 Power parameter
  - 2.2 X-ray generator Parameters
  - 2.3 X-ray tube parameters
  - 2.4 Machine parameters
  - 2.5 Beam limiter parameters
3. Control system
  - 3.1 Control system description
  - 3.2 Equipment structure description
  - 3.3 Operation panel description
4. Directions for use
  - 4.1 Usage method
  - 4.2 Cleaning and disinfection and maintenance
  - 4.3 Transport and storage conditions
  - 4.4 Disposal of scrap equipment
  - 4.5 F Fault code display
5. Product warranty
  - 5.1 Product quality assurance
  - 5.2 Product warranty card

## **1. Summary**

### **1.1 Product usage**

High frequency dental X-ray machine is used for oral medical institutions taken X-ray diagnosis of the equipment used for lesions in the teeth.

### **1.2 Structural components**

High frequency of dental X-ray machine is mainly composed of high frequency X-ray tube ball head, control circuit, LCD touch display systems, lithium battery power supply system.

### **1.3 Electrical classification**

The product electric classified as class B type I equipment.

### **1.4 Product features**

- 1. This device adopts microcomputer chip processor, high frequency inverter output of a more stable way of x-rays, to generate high resolution imaging effect.**
- 2. This equipment adopts the microfocus X-ray generator, reduce equipment volume and weight, it is more convenient to carry.**
- 3. This equipment adopts the high definition resolution color LCD touch display system, simple operation.**
- 4. This equipment design has a boot self-checking system self-diagnosis function, easy maintenance and repair.**
- 5. This equipment is one-to-one custom-made using high capacity lithium battery, durable.**

### **1.5 Debug instructions**

- 1. Determine the power supply voltage conform to the requirements of the manufacturer of power supply voltage of the charger.**
- 2. In accordance with the requirements of manufacturers and the procedure to test the product.**
- 3. To provide customers the product specification.**

### **1.6 User instructions**

- 1. Users must comply with the instructions to use the device.**
- 2. The user must comply with the product instructions to use the device; If because the user improper use or maintenance of injuries, equipment damage, manufacturer and distributor doesn't take any responsibility.**

3. If the device related accidents occur, please contact the local health authorities, local dealers and manufacturers.

### 1.7 Warning and attention

**Warning:** this product is precision electronic medical equipment, non-professional personnel without permission, Prohibit operation the following items:

1. To open the shell products;
2. Replacement lithium battery and other accessories.

**Note:** this product is precision electronic medical equipment, in use process should pay attention to the following items:

1. Please note that when using the movement wants gently;
2. When using may produce a small amount of ionizing radiation, pregnant women and young children, please pay attention to the protection;
3. It is prohibited to use in the process of charging, long time need not, please note that charge in a timely manner.

## 2. Technical parameters

### 2.1 Power parameter

1. Input Power: 100-240VAC/50-60Hz/1.2A
2. Output power: 25.2VDC/2.0A
3. Li-ion battery capacity:

### 2.2 X-ray generator Parameters

1. Input Power: 22.2 VDC / 10 A
2. Output power: 80 W
3. Tube voltage / current: 60KV/1mA
4. Operating frequency: 20KHz
5. Exposure time: 0.1-2.0S

### 2.3 X-ray tube parameters

1. Max. Operating tube voltage: 80KVp
2. Filament features:  $3\pm 0.5V/2.5A$
3. Nominal focal spot value: 0.3mm
4. Target angle:  $12^\circ$
5. Inherent filtration: 0.75mmAl

### 2.4 Machine parameters

1. Display mode: LCD color touch screen
2. Packing size: 35X16X25cm
3. Net weight: 2.0kg

## 2.5 Beam limiter parameters

1. Output the focal length: 110 mm
2. Output radiation scope:  $\varnothing$ 5mm

## 3. Control system

### 3.1 Control system description

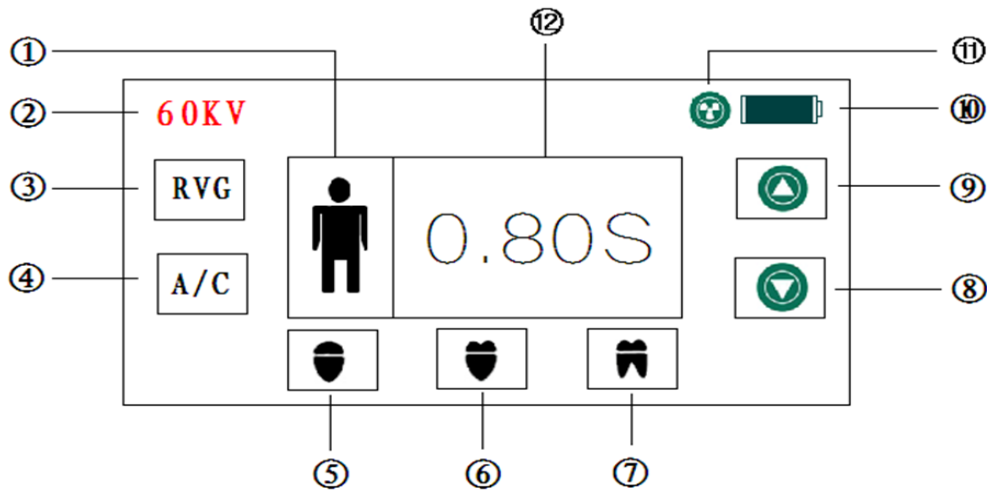
1. The microprocessor control system.
2. According to the tooth bit and mode automatically choose the exposure time , time range: 0.1 -2.0 S.
3. Manually adjust the exposure time, every time to adjust time of 0.1 S.
4. Equipped with three block mode selection switch, respectively is: children, adults and RVG (digital sensing mode).
5. Manual switch can choose can extend and hand control wire.

### 3.2 Equipment structure description



- |                |                    |                 |
|----------------|--------------------|-----------------|
| ① Power Switch | ② Exposure Switch  | ③ Beam Limiter  |
| ④ Wrist Strap  | ⑤ LCD Touch Screen | ⑥ Charging Port |

### 3.3 Operation panel description

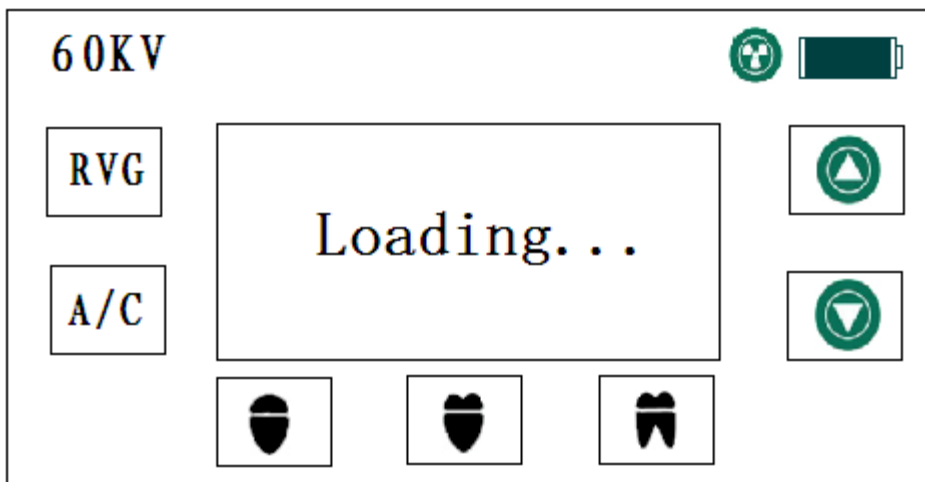


- |                                |                  |                 |
|--------------------------------|------------------|-----------------|
| ① Mode display                 | ⑤ In the incisor | ⑨ Increase time |
| ② Voltage display              | ⑥ Premolar       | ⑩ Power display |
| ③ Digital sensor model display | ⑦ Molar          | ⑪ Exposure      |
| ④ Adult child mode             | ⑧ Reduce time    | ⑫ Time display  |

#### 4. Directions for use

##### 4.1 Usage method

1. Press the power switch button, the device has reached the state of loading, loading time is 5-6 s; Loading period, loading points are in a dynamic state, as shown in the figure below:



2. In the process of loading equipment will start self-checking function, If have the failure will display failure code (please see note 4.5 fault code specific fault code), are shown in figure 1 below: If trouble-free, into the normal state, as shown in figure 2:

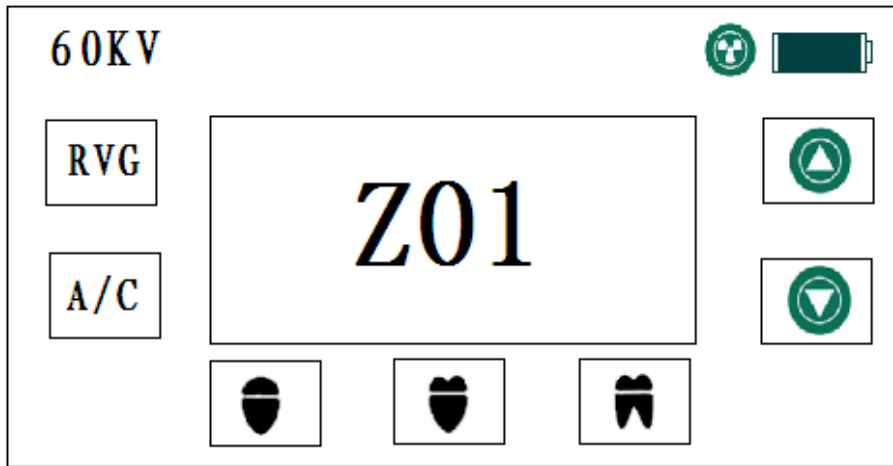


图 1

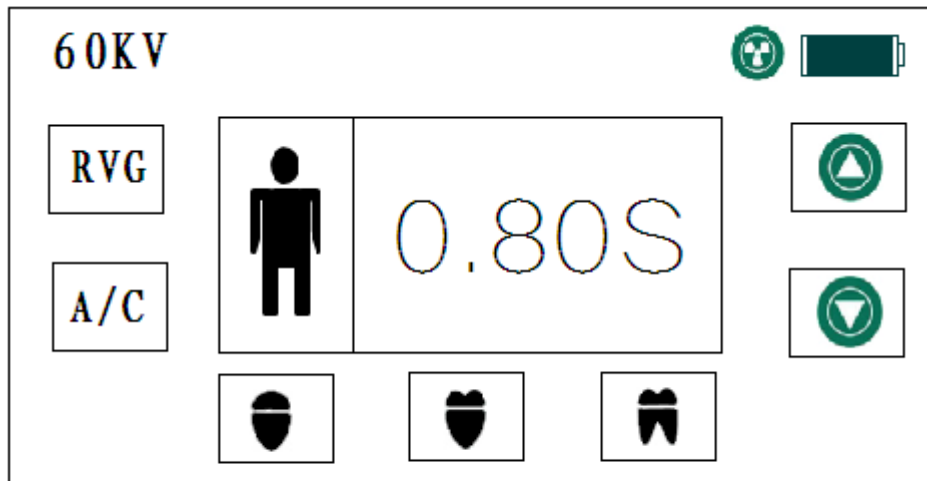








图 2

3. Into the normal state, the next step selection mode; There are three kinds of modes, respectively, children and adults RVG (digital sensing mode); Selection mode is completed, the next step to choose to shoot tooth area, respectively have, In the incisor, premolar and molar teeth after a regional choice. Every area of the teeth have a shot time please refer to the following table data: (Note: Because of different sensors and film sensitivity is different; Please adjust the exposure time before using, the table below data is for reference only.)

Teeth		Model	Time
		Adult	0.5-0.7S
		Child	0.3-0.5s



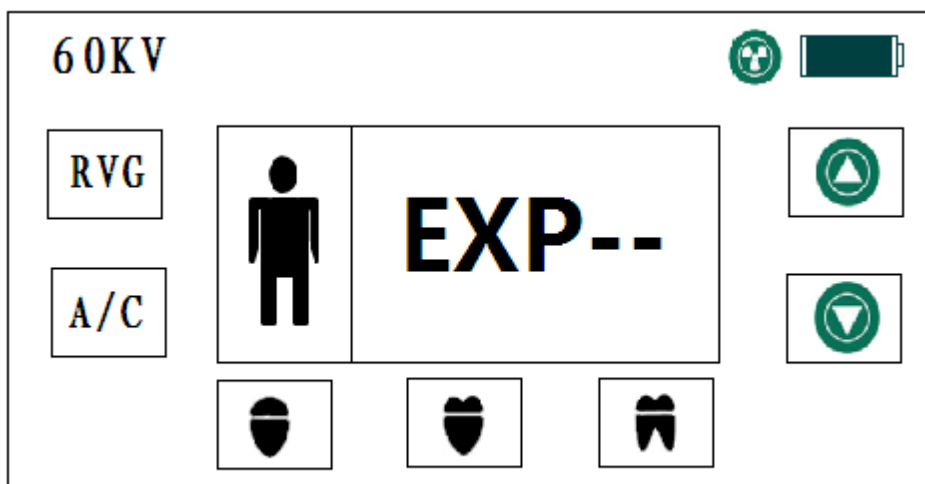
Maxillary		RVG	0.2-0.3s
		Adult	0.8-1.0s
		Child	0.5-0.7s
		RVG	0.3-0.5s
		Adult	1.2-1.5s
		Child	0.8-1.0s
Mandible		Adult	0.4-0.6s
		Child	0.2-0.4s
		RVG	0.2-0.3s
		Adult	0.6-0.8s
		Child	0.4-0.6s
		RVG	0.3-0.4s
		Adult	1.0-1.3s
		Child	0.8-1.0s
		RVG	0.5-0.8s

4. The pattern and the tooth to adjust well, the next step into the shooting Angle adjustment phase, different teeth corresponding to different angles, detailed parameters refer to see table data:

	Teeth	Angle
Maxillary	1、 2	+42°
	3	+45°
	4、 5、 6	+30°
	7、 8	+20°
Mandible	1、 2	-15°
	3	-20°
	4、 5、 6	-10°
	7、 8	-5°

5. After the mode, tooth position, Angle adjustment is completed, the next step can be taken; After exposure button, buzzer will appear "drop" sound of hint, the screen shows "EXP –" at the same time; The "exposure indicator light" flashing in red and blue. Then exposure succeed. If there is an error

code in the process of exposure, please stop using immediately, and with reference to the error code to find the solution. Exposure successful display interface as shown below:



6. After exposure, the standby protection status, to 60 s, 60 s after restores last exposure Settings; Before that, in addition to the power switch, all keys are in the locked state.

7. Please counterclockwise unscrew the beam limiter for Charging, plug in the charger power supply (Note: at the bottom of the screen to the left of the first port is charging port); The light on the charger from red on change green , charge complete.

8. After completion of shooting, such as no need to continue filming, please shut off the power, put back in place.

#### 4.2 Cleaning and disinfection and maintenance

1. Before cleaning will shut off the power switch. Can use a small amount of mild decontamination materials and soft cloth to remove the product shell stains, remember not to let any liquid flow into the equipment.

2. For parts because accident and access to the patient, must use clean disinfectant to clean, and disinfection; Remember do not use disinfectant containing soluble solvent or corrosive solvent.

3. Must pay attention to keep the charge of lithium-ion batteries, long time no or under the condition of electricity shortage, please recharge in time. The charger indicator lights changed from red to green, charging is complete.

#### 4.3 Transport and storage conditions

This equipment in stored in the transport process, can not be stored in the corrosive gas, chemicals and flammable and explosive environment, in the process of transport do not drag, roll, throwing, extrusion, etc all strenuous exercise.

1. Ambient temperature: -20°C-55°C

- 2. Relative humidity: 10%- 60%
- 3. Atmospheric pressure: 500Hpa-1060Hpa

#### 4.4 Disposal of scrap equipment

This equipment is a high frequency of dental X-ray machine, it is made of a variety of materials, including iron, copper, lead and other metals, plastics, electronic components, insulating oil, X ray tube, etc.; When the system is discarded, ban thrown in the natural environment, must be in accordance with the relevant laws and regulations to the professional recycling company for processing.

#### 4.5 Fault code display

Fault Code	Fault Description	Corresponding Action	Solution
Z01	The battery voltage is too low	Turn off the power	Immediately charging is completed, will be used regain.
Z02	Filament voltage is too low	Turn off the power	Immediately charging is completed, will be used regain.
Z03	Output over-current protection	Turn off the power Exposure to ban	Turn off the power, Wait for 15 minutes and then use.
Z04	X- ray tube temperature is too high	Turn off the power Exposure to ban	Turn off the power, Wait for 30minutes and then use.

### 5. Product warranty

#### 5.1 Product quality assurance

The company promises to provide products for the original factory production of qualified products. This product the machine free warranty for two years, the charger 1 year warranty (Lithium battery is the consumption of materials, no warranty); Because this product quality problems, the company shall be free warranty. The following factors is beyond the scope of warranty:

1. Due to the improper use of maintenance of the human factors and supply voltage instability caused by the damage.
2. Damage caused by natural disasters or irresistible factors.
3. Non-professional staff without permission to repair damage.

#### 5.2 Product warranty card

**Product warranty card**

<b>Product Name</b>	<b>High Frequency Portable Dental X-ray Machine</b>
<b>Product Model</b>	
<b>Product NO.</b>	
<b>Date of manufacture</b>	
<b>Distribution Company</b>	
<b>Buy the unit</b>	
<b>Warranty Period</b>	
<b>Maintenance Record</b>	