

# PORTABLE DENTAL X-RAY MACHINE

## User Manual

This model combines the advantages of similar products found at home and abroad; it eliminates the shortcomings of the on-frequency X-ray machine (high current intensity and excess amounts of scrap x-rays). The tube voltage frequency of this machine is 30 KHz, and the tube current is 0.1 MA. The radiation scope is at an angle of 24 degrees, located within a distance of 1.2 meters ahead. This is an innovative Chinese design named the "Green X-ray Machine."

All the components of this product were originally imported to achieve an acceptable tolerance required for the digital controls and the machine. By doing this, product performance is more stable and reliable.

Using a Toshiba 0.3 x 0.3 micro-focus tube, the image is clearer and more delicate. This machine uses components from well established suppliers, allowing us to deliver to our customers a product of high quality.

There are films included for testing purpose and all the consumables can be replaced by other similar products.

There are vacuum components and high-pressure parts inside of the machine, so for your safety and the maintenance of the machine, please do not open the machine. Service and maintenance should only be performed by a trained professional.

The tube head is equipped with excellent radiation-shield protection (except the radial mouth, and tests have shown that the radial index is zero. Safety is guaranteed.

Non-film inspection and storage can be realized when corresponding to a sensor.

### **Packing List:**

1. Main Unit
2. Ball Head
3. 2 cables
4. Blue tube
5. Other accessories for test. (Kodak Films, etc.)

### **The Composition and Use of the Equipment**

The machine is made up of two parts: the main unit and the ball head. The main unit includes the power supply, central data processing unit, and the part to shock, enlarge, and feedback. The ball head is made up by components with functions of controlling pressure and frequency and ball tube, vacuum sealed part, etc. The shell is from an injection mold with lead sealing protection.

The machine is mainly used in dental clinics, to check out before treatment, and to be used for comparison and confirmation during and after treatment. It is an indispensable piece of equipment for daily work within a clinic. Some examples of its use include checking tissue structure, the depth of the root, the degree of inflammation, and for the inner inspection of broken teeth.

While using a small amount of radiation there is no need for protection. Hospitals have purchased this machine to take films of fingers and toes by the side of a patient's bed.

### **Operation of the Main Unit**

1. Upon receiving, open the box and check the product for possible damage during shipping.
2. Make sure the fittings on the encasement list are packaged within the box.
3. Connect the six-core cable (of the Main Unit) to the joint of the ball head and tighten the screw; Install the blue ray tube to the foreside of the ball head, then tighten it.
4. After the Main Unit and ball head are perfectly fit together, plug in the international standard electrical source, grounding is strongly recommended.
5. Turn on the Power; the pilot lamp will be light up. During this time, the digital tube of the main unit will show the fore setting time. Now the equipment is in standby mode.
6. **Setting the time** (Skip to next step if unneeded) Use the "SET", "+", and "-" buttons to reset the time as follows: press SET, the pilot lamp above is illuminated, the machine is now in the time setting mode→then press "+" and "-" to set the time needed (time range is 1-9seconds); press set again when the time is adjusted the light lamp is off. The equipment is now in standby mode.
7. Put the Tooth film plumb behind the tooth which is going to be taken picture, and be as close as possible (the smooth side stick to the tooth)
8. Keep the ball head plumb to the tooth projection position; Have the ball head, tooth, and tooth film steadily mutually plumb.
9. After positioning, use the **ON/OFF** on the main Unit, the remote controller, or the button on the touch head tube to take pictures. The three methods have the same effect. (Notice: gently press 0.5 sec to turn it on)
10. After exposure to the tube, press the start button again (available in three ways) in case of an emergency to stop shooting and return to standby status. (At this point there was no output ray, so the dental films can be used again).
11. Repeat step 6 to reset the picturing time. To repeat the picturing process, please repeat steps 7 to 9.
12. Turn the power of the main unit off when the work is finished, press **POWER**, making sure the pilot lamp is off. Don't keep the main unit long in standby mode.

### **Developing the Dental film**

1. Picture the tooth following the right operating procedure of the X-ray Unit, then take the film out from the mouth.
2. Use a syringe to extract 4-5 ml of imaging liquid.
3. Transfuse the liquid into the bag, nip both the ends and the sides of the bag with thumbs and first fingers (knead the film).

4. Open the end of the bag about ten minutes after transfusing the liquid into the bag.
5. Take the film out, put it into clear water, and rinse it. Don't wipe the surface of the film with the surface to prevent damage to the image.
6. Observe and diagnose after the film becomes dry.

### **Points for Attention**

1. Make sure the angle of film, tooth, and ball head are properly aligned when taking a picture. Keep them steady until the last step of picturing; making sure that there is no change in any of their positions.
2. Remember to turn the power off when work is done.
3. Change the battery if the remote controller loses its functioning or if the remote's distance is shorted.
4. After turning the power on, wait one minute before taking pictures, this allows the ray to provide a steady output.
5. The equipment switches into protection mode automatically when the voltage is incorrect. If this occurs, it will not be able to carry out the normal work of filming.
6. When taking pictures, the **ON/OFF** button could stop the objection and then the machine goes back to the preparation mode.
7. Use high quality tooth film and developing liquid to make clear pictures.
8. Handle the ball head gently while in use, so as not to damage the delicate component.
9. Do not pull hard on the cable which connects the ball head to the main unit.
10. The cable connecting the ball head to the main unit cannot bear the weight of the ball head, so do not raise the ball head by holding the cable, it will cause damage.
11. We usually set the time between 3-8 seconds when taking pictures, but the actual time of ray output is 0.2-0.5 seconds.
12. If a situation occurs, preventing the machine from taking regular pictures, contact the seller to solve the problem instead of trying to service the product yourself.
13. Keep the tooth film and the liquid in a proper place and use them within the shelf-life period.
14. Development of films should be performed at temperatures ranging between 23-25 degrees Celsius to ensure the image quality.
15. Other requests accordance with the scope of the technical parameters.
16. Please read the manual carefully before using.

### **Warranty**

We offer a 1 year warranty as follows.

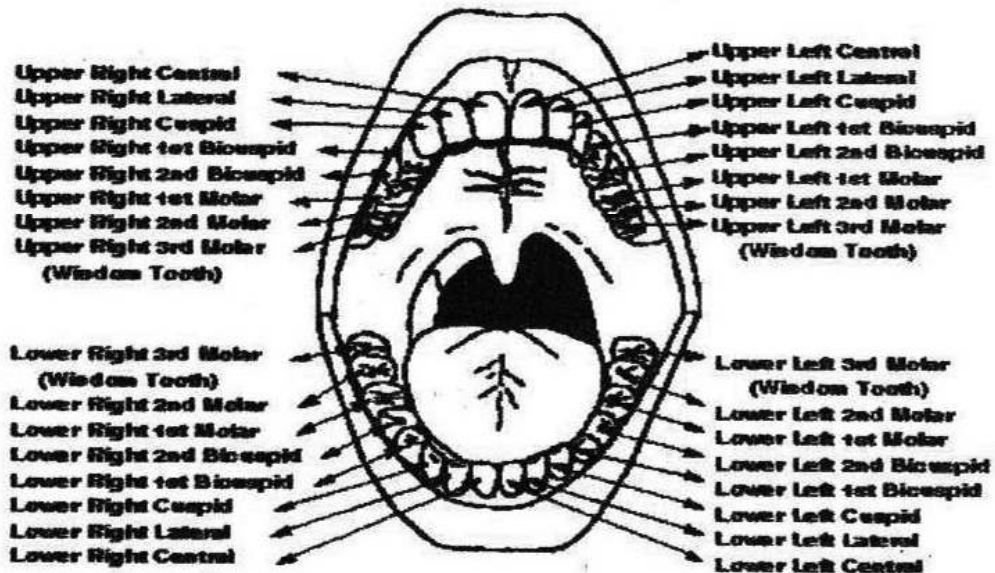
(Note: When warranty expires, we charge for the replacement and repairs of the machine and components.)

The following cases are **not** within the scope of this warranty:

- Intentional damages to the main part and ball head which cannot be repaired.

- Opening the machine for purposes of reverse engineering for means of imitation.
- Getting burned using the wrong power supply.
- Modifications to the machine, such as the addition of extra components to the machine resulting in damage that prevents the normal use.

## References



The Angle should be proper while taking a picture. The film should be put vertically behind the tooth to be taken a picture while the case is for the front teeth; and the film should be put transversely behind the tooth to be taken a picture while the case is for the back teeth. The patient should use forefinger to press the film behind the tooth gently.

\*Kodak film as the sent samples are strongly recommended.

### Reference of the Angles

Tooth	Upper	Lower
1-2	42	-15
3	45	-18
4-5	30	-10
6-8	28	-5

### Reference of the time of exposure

Tooth	Adult	Child
Central & Lateral	2.5-3.25	2-2.7
Cuspid & 1 <sup>st</sup> Bicuspid	3.2-4	2.7-3.5
Upper 5, 6	3.5-4	3-3.5
Upper 7, 8	7.5-8	7-7.5
Lower 5, 6	4-4.5	3.5-4
Lower 7, 8	4-4.5	3.5-4



## Trouble Shooting Instructions

Failure	Reason	Solution
Machine does not display after being connected to power	Loose connection of the plug	Check the plug again and the connection of the joints
	Broken fuses	Change the fuses
The pilot lamp lights up but the digital tube of the main unit does not show the fore setting time	Abnormal Power supply	Plug to the right Power supply
	Circuit damaged	Send the product back to the factory or distributor to repair
No image is taken while the counting down works	Connection problem with the Main unit and the Ball head	Send the product back to the factory or distributor to repair
The remote control does not work Within the normal distance	Battery low	Change for new batteries
	Damage in the remote control	Change for a new remote control or sent it for a repair
The time setting does not work	Error in the control program	Re-start on the machine
	Problem with the SET button	Send it for a repair
No counting down after press Start	The pilot lamp light is on for the SET	Shut down the SET mode
Blurred film	The film, tooth, and ball head are not stable while taking a picture	Operate again rightly
	The film is too far from the tooth that is taken a picture	Operate again rightly
	Wrong angle of taking a picture	Operate again rightly
The image is too light	The time of exposure is too short	Reset the exposure time and make it longer
	The time of developing the film is too short	Lengthen the developing time
The image is too dark	The time of exposure is too long	Reset the exposure time and make it shorter
	The time of developing the film is too long	Shorten the developing time
Other possible reasons for a Blurred film or a blank film	The film is of poor quality	Change for a better film
	The imaging liquid is of poor quality	Change for a better liquid
	The temperature is too low while developing the film	Develop the film in a higher temperature