PORTABLE
DENTAL X-RAY UNIT



Dentalzone

USER MANUAL

www.dentalzone.nl

PREFACE

We much appreciate your kindly selection for our portable dental X-ray unit. Please read the operation manual carefully before using , so that you could learn all the details about technical specification , installation , operating methods and maintenance . Please connect with the dealer if you have any problem after reading the operation manual . Thank you again.

Equipment Maintenance

Because the equipment include the users operation and diagnosing patients , therefore must be maintained , checked , diagnosed equipment maintenance every year, make sure the equipment safety. And this equipment involved in high voltage electrical control components, should check the safety of its insulation, grounding device reliability.

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Chapter 1
ABOUT THE SYMBOL

Serial number	Symbol	Explain
1		High voltage
2		X-ray emitting
3		Caution
4		Power off
5		Power on
6		Ground wire connector
7		Fragile
8		Up sign
9		Max accumulation
10		Dryness
11		Dose permission sign
12		BF type

Chapter 2 INTRODUCTION

2.1 Characteristics and main use

This portable dental X-ray unit is high frequency machine . The body is small , light weight and nearly no radiation. It has excellent image quality , portable storage , save more space. It uses high frequency and DC international power supply . All of the components installed in the central PC board concentrated. Shock, set-up , electron tubes , all of them are insulation vacuum , sealed stereotype protection . There are also manual buttons installed on the surface of shell, as well as batteries and charges.This unit mainly suitable for oral pre-treatment for learning internal organizational structure , root depth and so on , is indispensable in daily life clinic equipment,especially for dentalimplant surgery . It also can connect with sensor , isgreat convenience.

2.2 Checking and Security

⚠ Caution: Please learn relative security measures and functions given in the file or on the unit.

- Operating the device in the designated order.
- Keep the device and the cone clean.
- Please use or operate the device and parts after taking a necessary periodic inspection.
- If you discover some difference in the sensor images even if you inspected its x-ray exposure time in the same way as before , then it means that the radiation of x-ray is abnormal, you must stop using it immediately and allow it to be inspected.
- Keep the device in the place where children are unable to touch.
- Don't use or store where air pressure or temperature or moisture exceeds range.
- Keep good ventilation and avoid direct sunlight, protect against the eroding of dust and corrosive air.
- Don't use or store near to chemicals or combustible gas.

Chapter 3 SPECIFICATIONS

Tube voltage	60KV
Tube current	2mA
Exposure time	0.1-2.0s
Frequency	30KHz
Rate power	120VA
Distance from skin to cone	118mm
Tube focus	0.8mmx0.8mm
Battery	2200mAh
Charger input voltage	AC110V-240V±10%
Output voltage	DC14.8V-16.8V
Ambient temperature	5℃~40℃
Relative temperature	<75%RH
Net weight	1.9KG
Gross weight	4.2KG
Size(mm)	168*158*130
Package Size(mm)	365*320*245

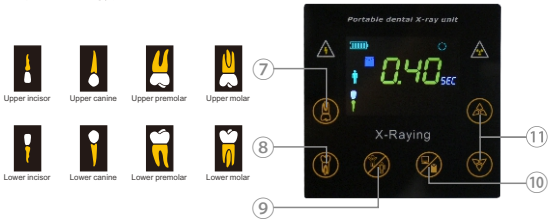
Chapter 4 STRUCIURE

3. 1 主机





3. 2 控制面板



4.1 The main body 4.2 Control panel

1- Exposure switch
2-Beam cone
3- Control panel
4- Charging hole
5-LCD screen
6- Power switch
7-Upper tooth position selection key
8- Lower tooth position selection key
9-Adult / children selection
10-Film / sensor selection
11-Exposure time adjusted

Chapter 5 OPERATION

5.1 Turning on the device

- Press the power switch button for three seconds , all characters will appear on the LCD screen and the buzzer sounds , then loosen finger ,the device will be ready for 5 seconds.
- Exposure condition will be displayed on the screen as the last time condition , it can saving the last time.
- The device will be turned off automatically if there is no any operation for 3 minutes.

5.2 Setting exposure time

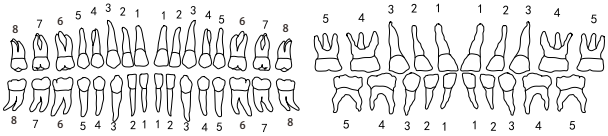
- Select tooth position
- Press the"  " to select film.
- Press "  " again to select sensor.
- Press the"  " to select adult.
- Press "  " again to select child.
- Press the "  " to increasing 0.02 sec for each step if necessary.
- Press the"  " to reduce 0.02 sec for each step if necessary.

5.3 Exposure time reference

Adult								
Child								
Film(sec)	0.2-0.3	0.3-0.5	0.5-0.6	0.6-0.8	0.8-0.9	0.9-1.1	1.1-1.2	1.2-1.4
Sensor(sec)	0.1-0.2	0.2-0.4	0.4-0.5	0.5-0.7	0.7-0.8	0.8-1.0	1.0-1.1	1.1-1.3

5.4 Image receiver placement and shooting position of internal oral

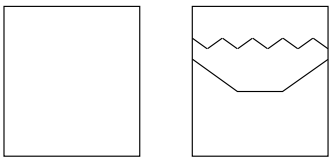
■ Teeth diagram



Adult teeth　　Child teeth

■ Image receiver placement of internal oral

a. Film placement



Put the film into mouth,film front close to the inside of teeth which want to image,use the thumb hold the film reverse， to make sure closely.

b.Sensor placement



Put the sensor into mouth , film front close to the inside of teeth which want toimage , use the thumb hold the film reverse， to make sure closely.

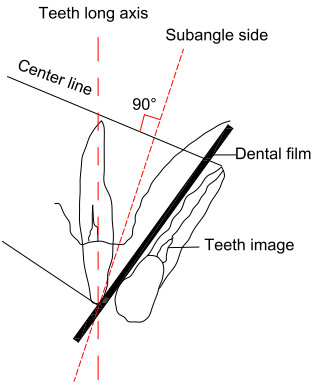
■ Shooting position

Patients posture : patient sit on the chairmaxillary and mandible incisor : lip is parallel to the ground . maxillary molar : ear- nose line (the line between upper external auditory canal andthe nose) parallel to the ground.mandible molar : ear - mouth line (the line between upper external auditory canaland the mouth) parallel to the ground.

■ Film and X-ray direction relation

a.Film and x-ray direction position as the figure below , X-ray along the centerline by teeth point to the film. Note horn line and the center line position , if thecenterline position deviation from the correct position (center line and Angle is lessthan or greater than 90 °) , then take a fake image , may shorter or longer thanthe actual teeth.

b.When shooting， the suggestion of the patients and the cone position (for adultsexample)
Mandible shooting: the cone aimed at the parts of shooting.

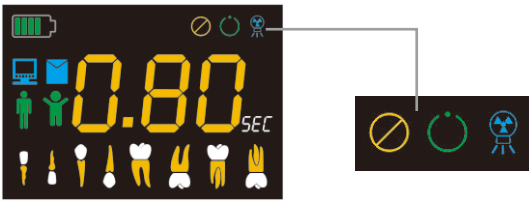


Maxillary shooting:
(6-7-6-7) teeth position， cone aimed at the edge of zygomatic;
(4-5-4-5) teeth position , cone aimed at the front of the zygomatic;
(3-3) teeth position , cone aimed at the side of the nose;
(2-2) teeth position , cone aimed at the tip and the midpoint of the side of the nose;
(1-1) teeth position , Cone aimed at the nasal tip.

5.5 Exposure

⚠ During the whole exposure process , you should keep pressing the exposure switch, and the exposure will stop immediately when you loose hand, then you need to restart the machine.

- Press the exposure switch, the icon appears logo on the top right of the LCD screen, and the machine is exposing.
- After the exposure process is over, the icon will be displayed logo on the LCD screen and the device will enter a cooling state . The next exposure cannot be performed until the LCD screen displays logo on the icon.
- During the exposure process, both hands should hold the equipment flat and not shake or shift.



5.6 Switch off the device

Press the power switch button for five seconds , hear a "beep", then release the power switch button then the device will be off.

5.7 Error messages

- If there is any error message occurs on the device, the message as follows may help you identifying the problems.
- **E01:** may lower battery, the battery needs to charge
- **E10:** may no filament voltage
- **E11:** may lower filament voltage
- **E12:** may higher filament voltage
- **E13:** filament may always bright
- **E30:** kV may abnormal

5.8 Charging battery

- High efficiency lithium battery enables you to irradiat x-ray more than 200 times after charging one time, and the battery are not easily to changed evenlong-term use.
- Using only the authorized charger provided as an accessory when charging the battery.



Chapter 6
WARNING AND NOTICE

6.1 Warning

- Warning About Using:
- Make sure the person who using this device is legally.
- If pregnant , ask a health professional before taking x-ray.
- An excessive exposure of radiation leaking may cause human body reaction lightly.
- Humidity conditions recommended for storage: 10-85%RH.
- Humidity conditions recommended for use: 15-80%RH.
- Optimal humidity range: 15-60%RH.
- Temperature conditions recommended for storage: 10-50°℃.
- Temperature conditions recommended for use: 10-35°℃.
- Optimal temperature range: 10-25°℃.

Other Warning:

- If any problem or error founded in the device, stop operating and then consult with the designated A/S center.
  Do not disassemble or modify the device, since it include generates x-rays, if not use properly , it may damage users or patients.

- Do not allow an unauthorized person to use or repair it.
- The range of permissible voltage AC 100-240V, please use the charger within this range.
- There is a potential danger for an electrical shock if you connect the power plug to consent or remove it.
- Do not touch the device with your wet hand or make a physical contact with the conducting part.
- If use an unauthorized charger , battery may be damaged.
- If not be used for long time,need to charge the unit per month.
- Used battery should not be thrown away in trash , please put that in a recycling box or exclusive case.

6.2 Notice

- Once charging had finished (indicator of charger changes from red to green), disconnect the DC output connect from the charger and pull out the power cord and store it.
- Battery is a expendable supply and duration of a battery is shortened slowly after the first purchase. Please buy a new battery if duration decreases by a half when compared to the first use. Contact the A/S center for purchase inquiry.

Chapter 7
MAINTENANCE AND KEEPING

- Keep the device in the place where only authorized personal can reach.
- Please clean the device daily by cleaning clothes and must keep cone clean.
- Please do not remodel the device arbitrary.
- Recommend to check the device once a year at the designated A/S center for safe use.
- Please recharge the battery every three months when it not in use for long time, and keep it in store.
- Daily tests and annual maintenance.
- When turn on , please confirm error message is not display on the LCD screen.
- Please confirm whether buzzer sound is heard and  on the LCD, and exposure LED could see normally at x-ray exposure.
- Every year for safe use , safety check-up is necessary.

Chapter 8 PACKING LIST

NO.	Name	Piece
1	Main body	1
2	Charger	1
3	User manual	1