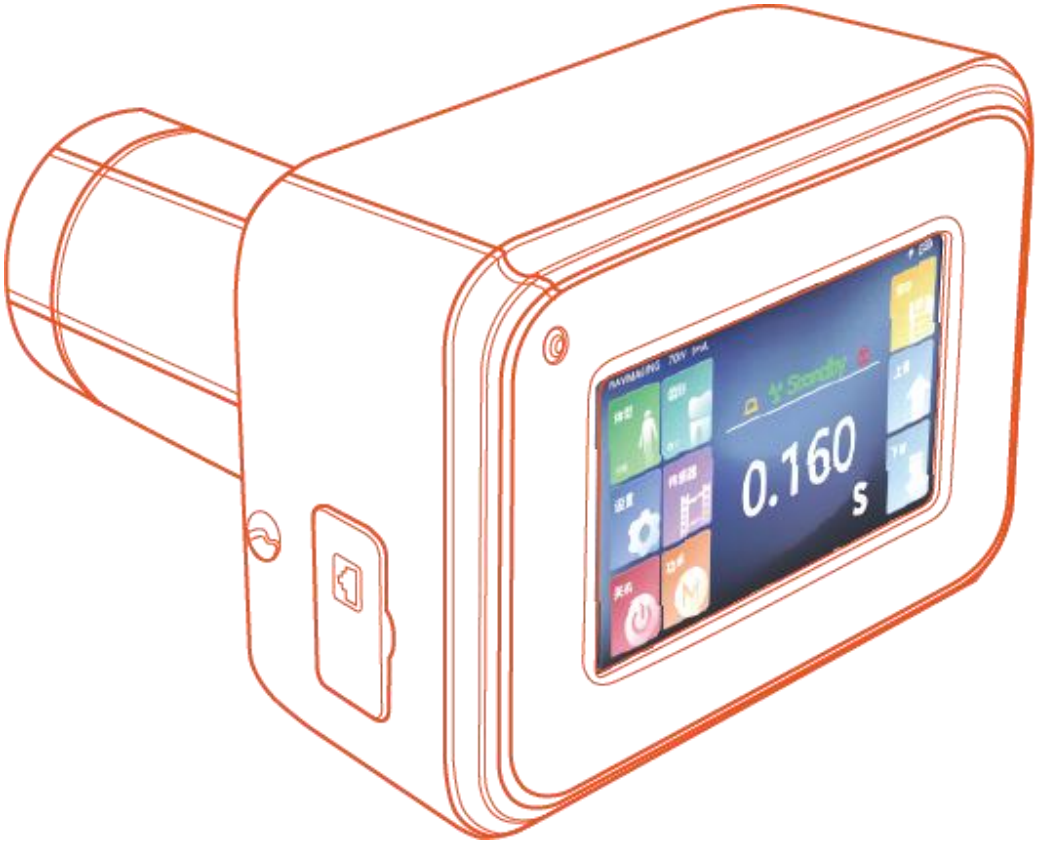
# Digital Dental X-ray Machine

# User's Manual




## ZHENGZHOU YP DENTAL CO.,LTD

Please visit the full version to download the website：wukongdent.com

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# 1. Product profile

Hand-held dental X-ray phosphor is an advanced high frequency dental X-ray equipment, using high frequency inverter technology to achieve dc high voltage output, with chemical film or digital sensor, used for X-ray photography of teeth, products need to cooperate with oral digital X-ray imaging system or dental X-ray film, in order to obtain images for clinical diagnosis.

Product name: Handheld dental X-ray machine

Model:K-RH210

Adjust the irradiation time after selecting the required tube voltage and tube current for the clinical application requirements. The above operations can be done quickly, by touching the control panel.

## 1.1 Features of the equipment:

1) Small size, light weight, easy for doctors to carry on home visits.
2) High-quality and efficient user operation interface, and easier shooting.
3) Small radiation, high efficiency, and can provide a good user experience.

## 1.2 Equipment size

Dimensions: 190mm 126mm 145mm

Overall weight: about 1 KG

X-ray tube assembly weight: 260g

## 1.3 Structure and composition

The product is composed of X-ray tube, high voltage module, control panel, beam limit, wireless remote control, lithium battery, charger and reverse shield (optional).

## 1.4 Installation and Commissioning

Handheld dental X-ray machine is handheld photographic equipment, which can be used in hand or mounted on devices such as tripod that meet the fixation requirements of handheld dental X-ray machine.

## 1.5 Use environment:

Keep the equipment in the following conditions:

- Temperature of storage: 10℃ ~40℃, humidity: 10% ~ 90% RH
- In-use temperature: -0 C~40 C, humidity: 30% ~ 70% RH
- Optimum condition temperature: 10 C~30 C, humidity: 40% ~ 60% RH

## 1.6 Main technical parameters

**Power supply:**

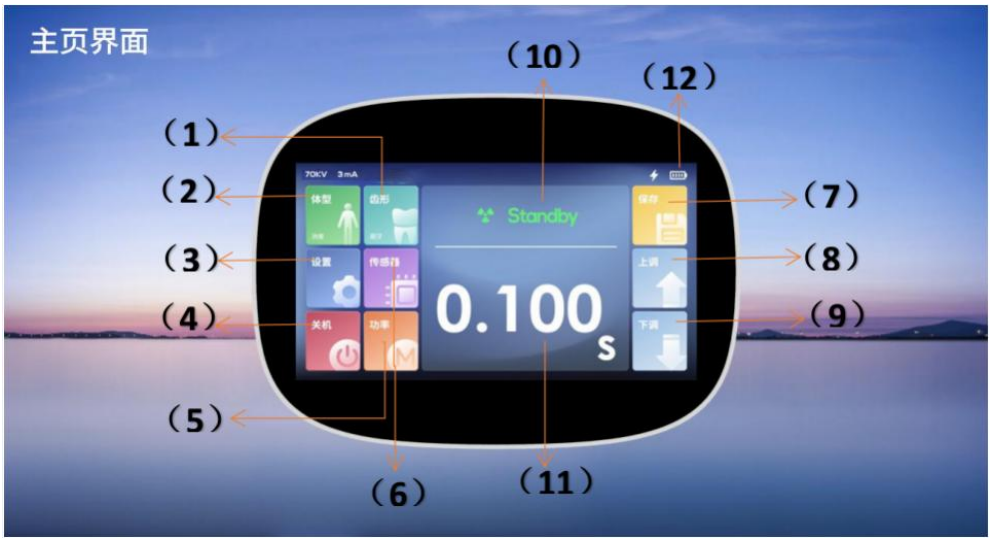
- **Battery**
  - Lithium-ion polymer type
  - Output voltage: DC 22.2 V
  - capacity:950mAh
  - Resistance: 0.17Ω
- **Charger**
  - Input power supply: AC220V± 10%
  - Power supply frequency: 50Hz ± 1Hz
  - Output voltage: DC25.2V
  - Output current: 1.0A
  - Status display of device LED (red: charging, green: charging)
- **X-ray generator:**
  - Tube voltage: 60kV / 65kV / 70kV (three-gear adjustable)
  - Tube current 2mA / 3 mA (two gear adjustable)
  - Exposure time: 0.010~1.000 seconds (manually adjustable);
  - Output radiation field of 60 mm SSD (Standard) 200 mm
  - Total filtration: greater than 2.0mmAl

## X-ray tube:

| | | |
|---|---|---|
| X-ray tube model | D-045 | KL11-0.4-70 |
| Nominal Voltage | 70kV | 70kV |
| Anode nominal input power small focus | 0.585kW | 1.2kW |
| Anode heat capacity | 4.3kJ | 4.5kJ |
| Maximum continuous cooling power | 100W | 110W |
| target angle | 12.5° | 12° |
| focus size | 0.4 | 0.4 |
| Target surface material | Tungsten | Tungsten |
| Maximum filament current | 3.0A | 2.9A |
| Maximum filament voltage | 3.0～3.7V | 2.4-3.0V |
| inherent filtration | 1.0mmAl/70kV | 0.8mmAl/70kV |

# 2. Installation of products and function description

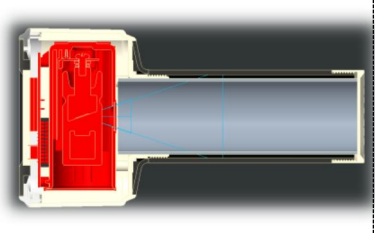
## 1.1 Interface display:




| | |
|---|---|
| （1）Tooth type button | （2）Body size selection button |
| （3）Set up the push button | （4）Turn on / off the button |
| （5）Select the power button | （6）Select the sensor button |
| （7）Save the button | （8）up-regulation |
| （9）down regulation | （10）Exposure status is shown |
| （11）Exposure time and parameters are displayed | （12）Battery charge indication |

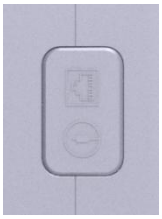
## 1.2 Functional explanation

| （1） Exposure button | |
|---|---|
|  | ➢ Press the button for the X-ray exposure operation.<br>➢ If the button is released early during the exposure process, an error message is given. |
| （2）X-ray cylinder | |



- The ray tube is built in lead protection to prevent exposing unnecessary X-rays to the user.

（3）interface



- RJ 45 port for external exposure hand brake and RS232 communication;
- Charging interface is used for external charger charging;

（4）Switch button key

- Short press to boot, open the device
- If pressed for more than 5 seconds, the device will shut down.

（5）Body size selection


- Press the button and the LCD screen displays Standard/Thin

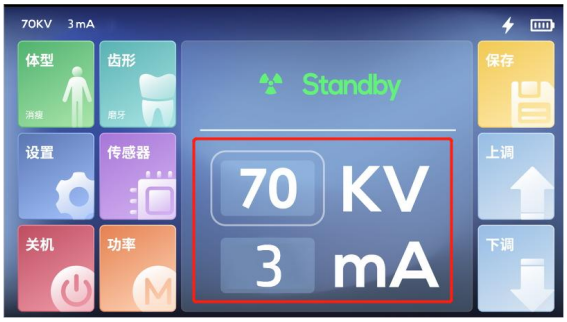
（6）Shutdown button

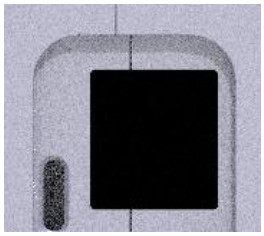
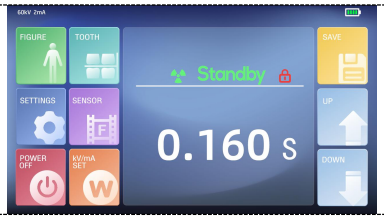
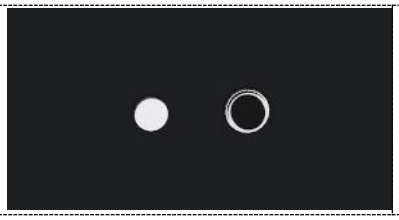

- Turn off the push button for the device.

（7）Dentistry selection


- Press the button to select the exposure tooth type.


（8）Power selection

| | |
|---|---|
|  | ➢ Press the button to adjust the kV / mA value.<br>  |
| （9）Increase the exposure time by (+) | |
|  | ➢ The exposure time will increase with the button press.<br>➢ Long press this button, and the exposure time increases rapidly.<br>  |
| （10）Lower the exposure time by (-) | |
|  | ➢ When the button is pressed, the exposure time will be shortened<br>➢ Long press the button to quickly reduce the exposure time |
| （11）Store the exposure power / time | |
|  | ➢ Press the button to store the exposure power / time. |
| （12）Charging connector | |

<table>
<tr><td>  </td><td>➢ The connector is used for battery charging.</td></tr>
<tr><td colspan="2">（13）Manual exposure switch connector</td></tr>
<tr><td>  </td><td>➢ The connector is used to connect using a manual exposure switch.</td></tr>
<tr><td colspan="2">（14） touch screen</td></tr>
<tr><td> 
</td><td>➢ Display the status and information of the device.</td></tr>
<tr><td colspan="2">（15）Bottom fixed hole</td></tr>
<tr><td>  </td><td>➢ Attach the device to the tripod.</td></tr>
</table>

# 3. Operating instructions

Users of this equipment must comply with the relevant operating specifications and regulations of the medical department and shall be used by trained doctors or technicians.

## Power on：

(1) When the boot button is pressed, the home page interface will be automatically displayed after about 1 second.

(2) When the battery power is insufficient, the battery icon flashes, and the prompt of "low power, please charge" is displayed. At this time, please charge immediately, otherwise it will automatically shut down due to insufficient power.

(3) It must be charged with a random adaptive charger.

## Power off：

If you want to turn off the device, press the LCD shutdown button or long press the housing left on / shutdown button.

## 3.1 Conditions of exposure

### 1) Conditions of exposure

Click the "Power" button on the home page interface, and the screen displays the kV / mA setting option, The following illustration shows:


Manually click to select kV or mA, and adjust with the right up / down. After setting, press "Save" button to save the current set parameters, and then press "Power" button to return to the home page interface.

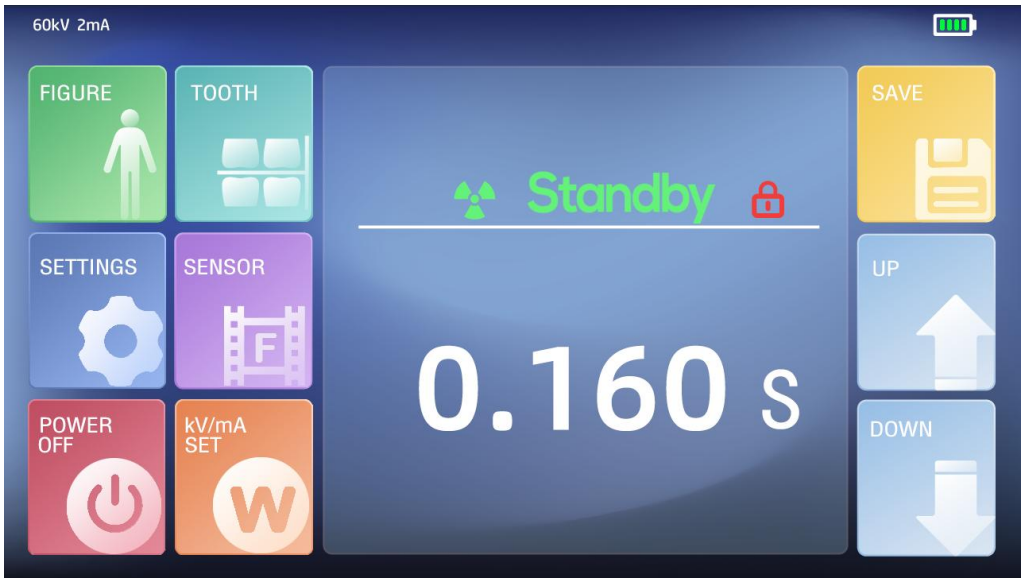
**2) Size type selection**

If you want to select the patient type, press the Body button to select Standard or Thin. The default is the "standard" body shape. If you need to switch, click the "Body shape" button to switch.

**3) Tooth type button**

Click the "tooth shape" button on the home page, and select the type of tooth to shoot (incisor, fangs, molar, occlusion).

**4) Touch screen display**




**5) Default exposure time**

| type | body shape | Incisor | fangs | molar | bite |
|---|---|---|---|---|---|
| number | standard | 0.16 | 0.2 | 0.25 | 0.5 |
| | thin | 0.125 | 0.18 | 0.22 | 0.32 |
| film | standard | 0.25 | 0.32 | 0.36 | 0.63 |
| | thin | 0.2 | 0.25 | 0.28 | 0.32 |

**6) Exposure time**

If you want to change the exposure time, you can use the Up / Down button.

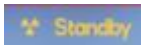
**7) Save exposure time**

Press the Save button to store the exposure parameters and time.

## 3.2 Exposure steps

**1)** First set the exposure conditions to be photographed (exposure gear, exposure time).

**2)** Fix the digital sensor or film on the other side to be exposed, and then connect it to the device of the exposed part.

**3)** Press the exposure button/remote control to enter the preliminary exposure state  , After about 1S, it enters the exposure state  , At the same time, the device beeps. When the beep stops, the exposure ends and the handbrake is released.

**4)** After completing the photography, the symbol is displayed on the right side of STANDBY. When this icon is displayed, the exposure cannot be made; the icon disappears and the next exposure can be started.

**5)** If the battery is fully charged, it can take about 150 shots. (Exposure conditions are 70KV/2mA/0.5S).

**6)** The single cell on the power display turns red. Please charge it immediately to avoid shutting down during exposure.

## 3.3 Charging batteries

Battery level is displayed in the upper right corner of the LCD. If the battery power is low, the image will be affected. Please always check the battery status.

## 3.4 Remote control function

### 1) Remote control pairing

Enter the settings page, click the "Down Arrow" button in the lower right corner to enter the next page, click to select the "Remote Control Pairing" function, a pop-up prompt "Do you want to start pairing?" then click "Yes", the screen will first display "Preparing", wait After a few seconds, the machine will make a beep sound and then display "Pairing...". At this time, press and hold the remote control. When the pairing is successful, the buzzer will make a beep sound and display "Pairing successful".

**2) Remote control exposure**

After setting the exposure parameters on the home-page interface, long press the remote control for exposure and wait for the buzzer to stop and release the remote control.

## 3.5 Set automatic screen lock time

Click to enter the settings page, click the "down arrow" button in the lower right corner to enter the next page, manually set the automatic shutdown time, the default is 5 minutes, the machine will automatically shut down after reaching the set time without operation, press the power button to wake up (to save Due to battery considerations, the screen will gradually reduce brightness when there is no operation. Click any button on the screen to restore normal brightness).

## 3.6 Factory data reset

Click to enter the settings page, click the "Factory Settings" button, the prompt "Do you want to restore factory settings?" is displayed, click "Yes", and all settings will be restored to the default settings after the buzzer beeps.

## 3.7 Default values and ranges

| Function | Functional scope | Default |
|---|---|---|
| body shape selection | Standard/Thin | Standard |
| F / D selection | Film or digital sensor | Film |
| Teeth selection | Teeth/Incisors/Canines/Molars/Occlusion | Incisor |
| Hibernation settings | Automatic power off | 5 minutes |

## 3.8 Joint use of imaging applications

The Portable dental X-ray machine needs to be used in combination with an oral digital X-ray imaging system or dental X-ray film to achieve clinical use.

**The steps for using the Portable dental X-ray machine in conjunction with the dental digital X-ray imaging system are as follows:**

a. The oral digital X-ray imaging system is installed and operated according to its instruction manual, and is set to receive X-rays;

b. The Portable dental X-ray machine sets exposure parameters according to the patient's condition and performs exposure actions;

c. Oral digital X-ray imaging system processes images.

5.2 Steps for the expected use of the Portable dental X-ray machine in combination with dental X-ray film:

a. The dental X-ray film is installed according to its instruction manual and placed on the patient's receiving site;

b. The Portable dental X-ray machine sets exposure parameters according to the patient's condition and performs exposure actions;

c. The dental X-ray film is processed according to its instruction manual to obtain images for clinical diagnosis.

- The oral digital X-ray imaging system used in conjunction with dental X-rays should be at least a Class II medical device product approved by the Food and Drug Administration. The oral digital X-ray imaging system should be used in strict accordance with its instructions;
- Dental X-ray films used in conjunction with dental X-rays should be at least a Class I medical device registered with the Food and Drug Administration. Dental X-ray films should be used in strict accordance with their instructions.

## 3.9 Ensure image quality

1) Parallel method technology, when available, can provide finer images from a size perspective than angle bisector technology. In order to obtain higher quality radiographic images, it is recommended that a focus-to-skin distance of 200mm should be used. (12") cm rectangular collimator To avoid that the image receiver (whether it is a sensor or film) is only partially exposed, it is recommended to use a centering device equipped with a guide wire for the rectangular collimator, which is located at the center On the ring. The recommended shooting angles are as shown in the table below.

| | | | | | |
|---|---|---|---|---|---|
| maxilla | Tooth shape | angle | jawbone | jugged | angle |
| | incisors | 55° | | incisors | -10° |
| | Premolars and canines | 45° | | Premolars and canines | -20° |
| | molar | 35° | | molar | -0° |
| | Bite wing shooting | 10° | | Bite wing shooting | -5° |

2）Recommended exposure time (unit: seconds)

➢ **Exposure conditions：60kV 2.5mA**

| patient type | Image device | Lower front teeth | Premolars /lower canines | Lower molar teeth | Upper door teeth | Premolars /upper canines | upper molars | Bite wing Shooting |
|---|---|---|---|---|---|---|---|---|
| standard | film | 0.25 | 0.32 | 0.36 | 0.25 | 0.32 | 0.36 | 0.63 |
| | figure | 0.16 | 0.20 | 0.25 | 0.16 | 0.20 | 0.25 | 0.50 |
| Thin body | film | 0.20 | 0.25 | 0.28 | 0.20 | 0.25 | 0.28 | 0.32 |
| | figure | 0.11 | 0.18 | 0.22 | 0.11 | 0.18 | 0.22 | 0.32 |

➢ **Exposure conditions：65kV 2.5mA**

| patient type | Image device | Lower front teeth | Premolars /lower canines | Lower molar teeth | Upper door teeth | Premolars /upper canines | upper molars | Bite wing Shooting |
|---|---|---|---|---|---|---|---|---|
| standard | film | 0.20 | 0.25 | 0.28 | 0.20 | 0.25 | 0.28 | 0.50 |
| | figure | 0.13 | 0.16 | 0.20 | 0.13 | 0.16 | 0.20 | 0.40 |
| Thin body | film | 0.16 | 0.20 | 0.22 | 0.16 | 0.20 | 0.22 | 0.25 |
| | figure | 0.09 | 0.14 | 0.18 | 0.09 | 0.14 | 0.18 | 0.25 |

➢ **Exposure conditions：70kV 2.5mA**

| patient type | Image device | Lower front teeth | Premolars /lower canines | Lower molar teeth | Upper door teeth | Premolars /upper canines | upper molars | Bite wing Shooting |
|---|---|---|---|---|---|---|---|---|
| standard | film | 0.16 | 0.20 | 0.22 | 0.16 | 0.20 | 0.22 | 0.40 |
| | figure | 0.08 | 0.13 | 0.16 | 0.10 | 0.13 | 0.16 | 0.32 |
| Thin body | film | 0.10 | 0.16 | 0.18 | 0.13 | 0.16 | 0.18 | 0.20 |
| | figure | 0.07 | 0.10 | 0.14 | 0.07 | 0.11 | 0.14 | 0.20 |

## ➢ Exposure conditions：60kV 3.5mA

| patient type | Image device | Lower front teeth | Premolars /lower canines | Lower molar teeth | Upper door teeth | Premolars /upper canines | upper molars | Bite wing shooting |
|---|---|---|---|---|---|---|---|---|
| standard | film | 0.22 | 0.28 | 0.32 | 0.22 | 0.28 | 0.32 | 0.56 |
| | figure | 0.14 | 0.18 | 0.22 | 0.14 | 0.18 | 0.22 | 0.45 |
| Thin body | film | 0.18 | 0.22 | 0.25 | 0.18 | 0.22 | 0.25 | 0.28 |
| | figure | 0.10 | 0.16 | 0.20 | 0.10 | 0.16 | 0.20 | 0.28 |

## ➢ Exposure conditions：65kV 3.5mA

| patient type | Image device | Lower front teeth | Premolars /lower canines | Lower molar teeth | Upper door teeth | Premolars /upper canines | upper molars | Bite wing shooting |
|---|---|---|---|---|---|---|---|---|
| standard | film | 0.18 | 0.22 | 0.25 | 0.18 | 0.22 | 0.25 | 0.45 |
| | figure | 0.11 | 0.14 | 0.18 | 0.11 | 0.14 | 0.18 | 0.36 |
| Thin body | film | 0.14 | 0.18 | 0.20 | 0.14 | 0.18 | 0.20 | 0.22 |
| | figure | 0.08 | 0.13 | 0.16 | 0.08 | 0.13 | 0.16 | 0.22 |

## ➢ Exposure conditions：70kV 3.5mA

| patient type | Image device | Lower front teeth | Premolars /lower canines | Lower molar teeth | Upper door teeth | Premolars /upper canines | upper molars | Bite wing shooting |
|---|---|---|---|---|---|---|---|---|
| standard | film | 0.14 | 0.18 | 0.20 | 0.14 | 0.18 | 0.20 | 0.36 |
| | figure | 0.07 | 0.10 | 0.14 | 0.09 | 0.11 | 0.14 | 0.28 |
| Thin body | film | 0.09 | 0.14 | 0.16 | 0.11 | 0.14 | 0.16 | 0.18 |
| | figure | 0.06 | 0.09 | 0.13 | 0.06 | 0.10 | 0.13 | 0.18 |

# 4. Troubleshooting

## Error code

When using the device, if there is an abnormality, the "error code" and the prompt message are displayed on the touch screen. Users can refer to the solution provided to check the fault. If the cause of the fault cannot be identified, or the following measures are still tried to solve the fault, please contact our customer service or authorized maintenance point. Please do not open the equipment without our guidance to avoid damage caused by misoperation.

| code | Failure/error | treatment measure |
|---|---|---|
| E1 | Memory, parameter is abnormal | Restart and reset. If it cannot be used normally, please contact our customer service |
| E2 | Bus overcurrent | Restart and reset. If it cannot be used normally, please contact our customer service |
| E3 | kV feedback overvoltage | Restart and reset. If it cannot be used normally, please contact our customer service |
| E4 | mA Feedback overcurrent | Restart and reset. If it cannot be used normally, please contact our customer service |
| E6 | Abnormal filament voltage | Restart and reset. If it cannot be used normally, please contact our customer service |
| E7 | kV Abnormal feedback | Continue to work after the restart or full charge. If you can not use it normally, please contact our customer service |
| E8 | mA Abnormal feedback | Continue to work after the restart or full charge. If you can not use it normally, please contact our customer service |
| E9 | Power supply abnormality | Continue to work after full charge, if not normal use, please contact our customer service |

# 5. Instructions

| | |
|---|---|
| [warn] | This equipment is intended for use by authorized or qualified pers onnel only. Please read the user manual before use. |
| [warn] | To protect the device from damage and ensure correct and safe use, be sure to strictly follow all manual precautions in the user manual. |
| [warn] | It is not recommended for pregnant women, lactating women and children. If necessary, it should be weighed and judged by professional medical staff. |
| [Precautions] | Practitioners must weigh the benefits of using this device against the potential harm from radiation exposure to pregnant women and fetuses. If the use of this device is deemed justified, the practitioner must take appropriate precautions (such as wearing radiation-protective clothing) to limit exposure beyond the area of the maxillofacial complex. |
| [Precautions] | Patients with medical conditions that cause involuntary movements. Practitioners must weigh the benefits of using this device in patients who experience seizures or are diagnosed with a condition that makes it difficult to control body movements, such as Parkinson's disease, versus redoing the image when involuntary movements render the image unusable for diagnosis. Potential harm to the patient due to additional radiation exposure from the scan. |

•Do not exceed the X-ray dose required for image diagnosis.

•For use by qualified personnel only.

•Do not let the patient touch the equipment.

•Do not leave equipment unattended around patients.

•If the device is defective, please contact your authorized dealer.

•Tampering with the device structure is prohibited.

•Avoid use in the following situations:

- Surrounded by flammable materials or explosive gases
- Damp or humid places
- direct sunlight
- Poor ventilation
- Dusty areas
- Where there is salt

# 6. Cleaning and maintenanc

Make sure the electrical outlet is unplugged before attempting to clean. When cleaning, make sure the power to the unit is turned off.
Use only non-alcohol disinfectant wipes or cloths dampened with liquid or spray.This device and the charger it comes with are not suitable for any type of disinfection.

## 6.1 Clean

- Never use anything other than mild soap and water to clean plastic surfaces. Other cleaners may damage plastic materials.

- Never use any corrosive, soluble or abrasive stain removers or polishes.

- Be sure not to allow water or other liquids to enter any equipment. This precaution prevents short circuits and corrosion on components.

- The disinfection methods used must comply with legal regulations and guidelines regarding disinfection and explosion prevention.

- If disinfectants that generate explosive gas mixtures are used, these gases must be allowed to evaporate before the equipment is switched on again.

- Disinfection by spraying is not recommended as the disinfectant may get into the X-ray equipment.

- If a sprayer is used for room disinfection, it is recommended to first switch off the device, allow it to cool and cover it with a plastic sheet. If residual disinfectant mist is present, the plastic sheet can be removed and the equipment disinfected by wiping it down.

## 6.2 Maintenance cycles and instructions

 Caution: The inspection process requires the generation of X-rays. Please follow correct operating procedures and take appropriate precautions against X-ray radiation.

WARNING: All maintenance should be performed by appropriate service personnel who are trained to service this equipment and who are familiar with the potential hazards associated with this equipment.

Statement: All components and parts of this equipment are not allowed to be replaced without permission. If necessary, please contact our after-sales personnel. Fuses,etc.cannot be replaced individually. If you need maintenance, please contact our company, which can provide circuit diagrams, component lists, legends and calibration details, etc.

NOTE: For the safety and health of patients, operators and third party personnel, maintenance and upkeep must be performed regularly.

1. Before using the equipment, users should routinely check whether there are any obvious defects or damage to the X-ray equipment. If any abnormalities occur, they should inform the after-sales service personnel of any obvious defects or abnormal operation of any equipment through the after-sales service contact number. , and discontinue use of equipment suspected of being faulty until repairs are completed. Continued operation of malfunctioning equipment may result in various safety hazards, including increased risk of radiation exposure.

A. Check all visual displays for normal operation (warning and status indications, technical parameter displays and indicators, etc.).

B. Check all audible indicators for normal operation (speakers, buzzers, etc.) and check that the volume settings are appropriate for the environment.

C. Check all interconnecting cables and connectors for damage.

D. Check whether the bolts and screws of the mechanical device are firm and whether they move smoothly.

**2.** Users are responsible for asking authorized technicians to perform periodic and preventive maintenance on their equipment once a year.

| cycle | operator | Purpose | describe |
|---|---|---|---|
| One year | Dealer's professional technician or manufacturer's authorized technician who installs the system | Ensure equipment functionality and performance are intact | In order to ensure the safe operation of the equipment, it is recommended to inspect all parts of the X- Ray to avoid any malfunctions or to repair faults that may be discovered |

**3.**Users evaluate image quality at least once a year:

- If intraoral X-ray imaging system is used for fluoroscopy, use the brightness or contrast adjuster in the image processing software to perform post-image processing increments as the evaluation criterion.
- If film is used for X-ray fluoroscopy, the increase in exposure time is used as the evaluation criterion.
- If this evaluation criterion is used as the default evaluation criterion, regardless of the patient's anatomy and possible sources of failure (such as patient positioning), the technician should be able to immediately eliminate possible equipment failures.

# 7. X-ray tube characteristics

**Absolute maximum and minimum ratings**

(At no time are these values allowed to exceed )

X-ray tube maximum voltage (IEC60613:2010)---70 kV

X-ray tube maximum current (IEC60613:2010) --- 24 mA (CP)/ 12 mA (half-wave

self-rectification circuit)

Maximum filament current---2.9 A

Filament voltage (at maximum filament current 2.9A) --- 2.4 ~ 3.0 V

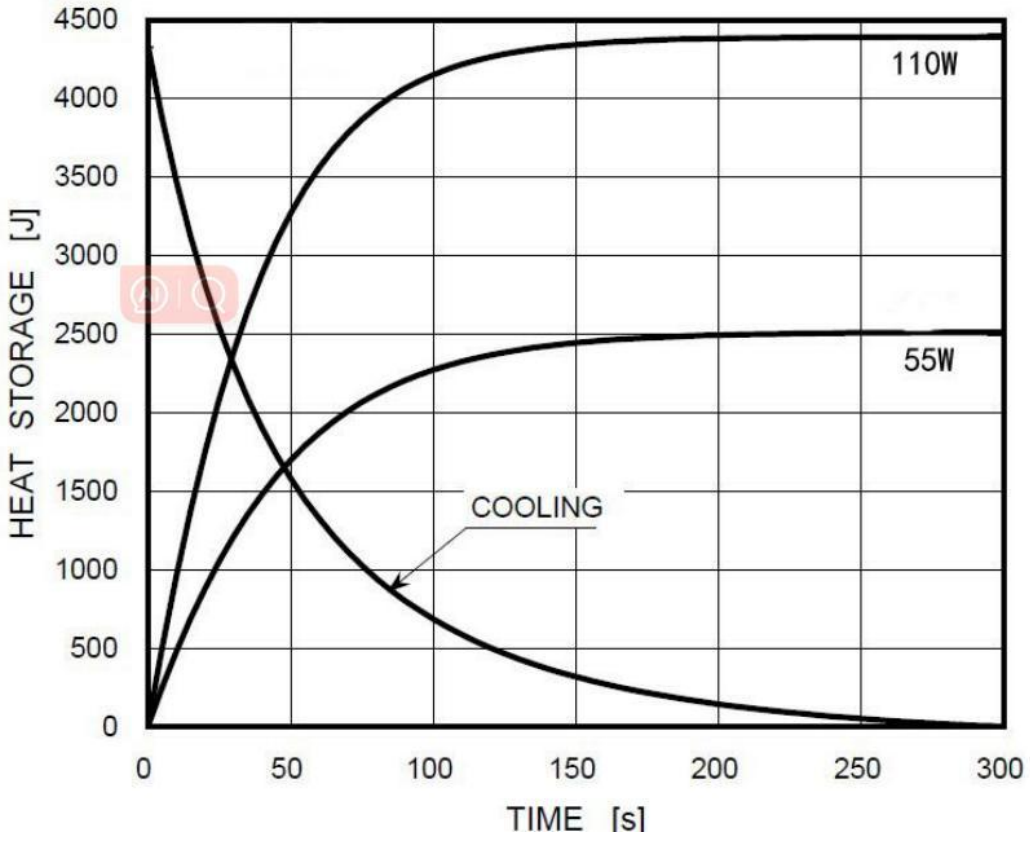
Thermal properties:

Anode heat capacity---4500 J

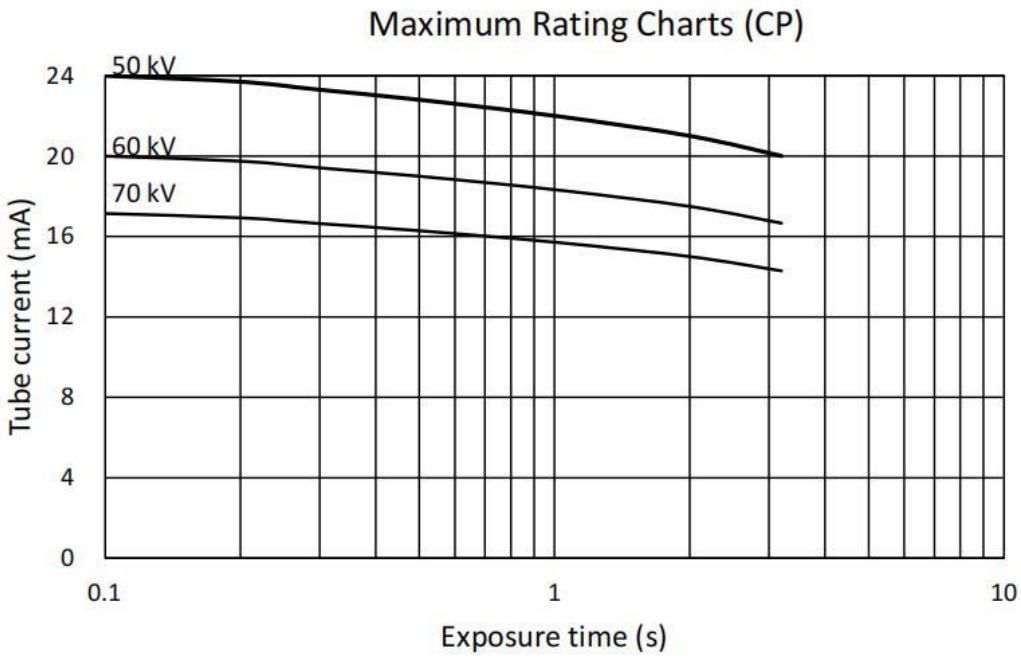
Maximum anode heat dissipation rate --- 110 W

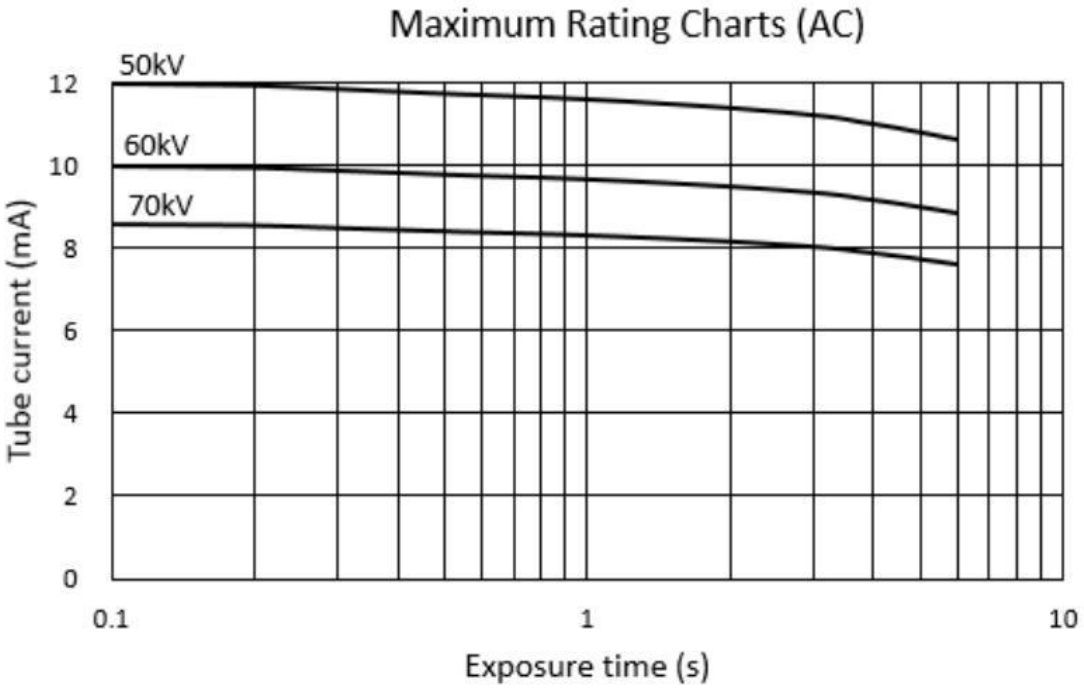
Wire length---100 mm

## Anode thermal characteristics

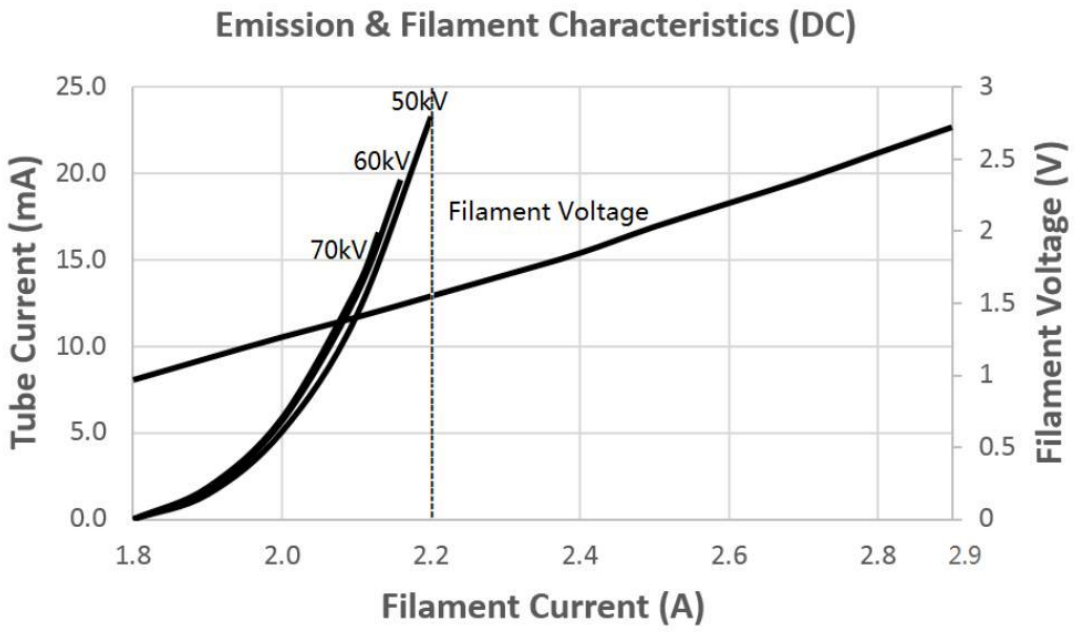


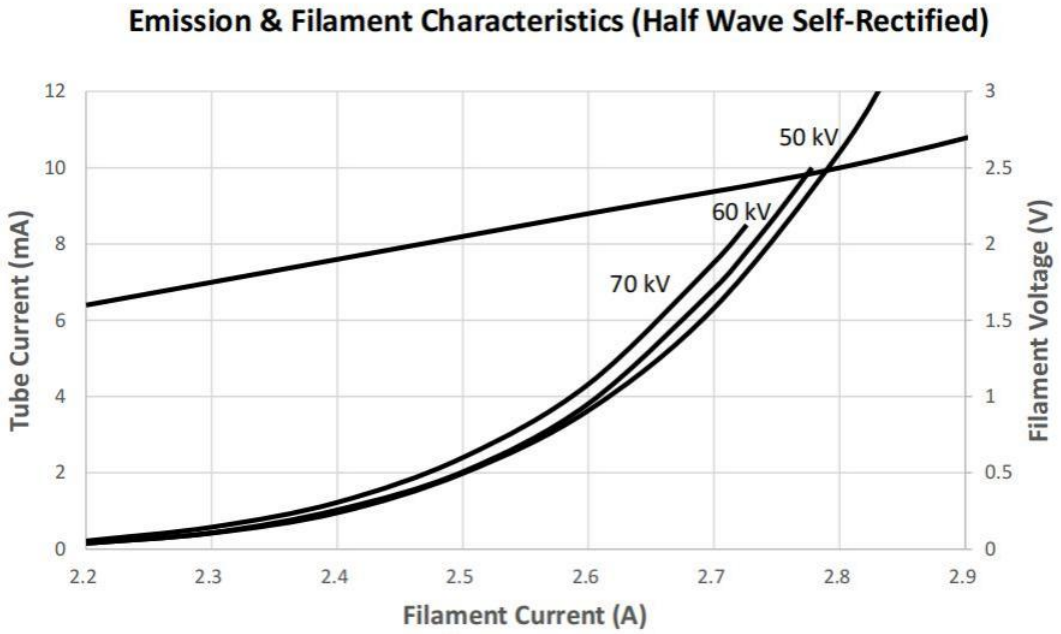
## Maximum Ratings Table (Absolute Maximum Ratings Table)



## Emission & Filament Characteristics



## Exposure dose rating

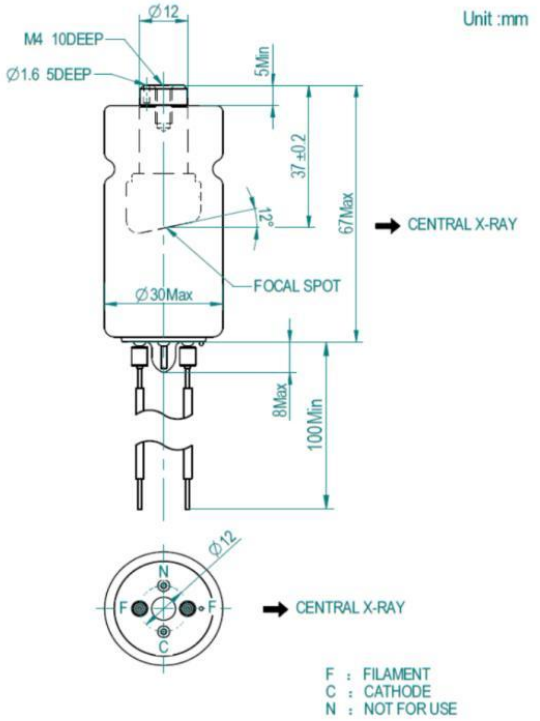
| Beam limiting tube | round$\phi$60mm | | | | |
|---|---|---|---|---|---|
| SSD | 200mm | | | | |
| A ($cm^2$) | 28.26 | | | | |
| KV-mA | 60kV 2.5mA | | | | |
| T (s) | dosage mGy | DAP mGy·$cm^2$ | T (s) | dosage mGy | DAP mGy·$cm^2$ |
| 0.01 | 0.025 | 0.71 | 0.02 | 0.05 | 1.41 |
| 0.03 | 0.075 | 2.12 | 0.04 | 0.1 | 2.83 |
| 0.05 | 0.125 | 3.53 | 0.06 | 0.149 | 4.21 |
| 0.07 | 0.174 | 4.92 | 0.08 | 0.198 | 5.60 |
| 0.09 | 0.223 | 6.30 | 0.1 | 0.248 | 7.01 |
| 0.11 | 0.272 | 7.69 | 0.13 | 0.296 | 8.36 |
| 0.14 | 0.346 | 9.78 | 0.16 | 0.395 | 11.16 |
| 0.18 | 0.445 | 12.58 | 0.2 | 0.494 | 13.96 |
| 0.22 | 0.543 | 15.35 | 0.25 | 0.618 | 17.46 |
| 0.28 | 0.692 | 19.56 | 0.32 | 0.788 | 22.27 |
| 0.36 | 0.863 | 24.39 | 0.4 | 0.985 | 27.84 |
| 0.45 | 1.107 | 31.28 | 0.5 | 1.23 | 34.76 |
| 0.56 | 1.374 | 38.83 | 0.63 | 1.549 | 43.77 |
| 0.71 | 1.741 | 49.20 | 0.8 | 1.961 | 55.42 |
| 0.9 | 2.207 | 62.37 | 1 | 2.447 | 69.15 |
| 1.1 | 2.694 | 76.13 | 1.25 | 3.061 | 86.50 |
| 1.4 | 3.427 | 96.85 | 1.6 | 3.915 | 110.64 |
| 1.8 | 4.397 | 124.26 | 2 | 4.885 | 138.05 |
| Beam limiting tube | round$\phi$60mm | | | | |
| SSD | 200mm | | | | |
| A ($cm^2$) | 28.26 | | | | |
| kV-mA | 65kV 2.5mA | | | | |
| T (s) | dosage mGy | DAP mGy·$cm^2$ | T (s) | dosage mGy | DAP mGy·$cm^2$ |
| 0.01 | 0.030 | 0.852 | 0.02 | 0.060 | 1.692 |
| 0.03 | 0.090 | 2.544 | 0.04 | 0.120 | 3.396 |
| 0.05 | 0.150 | 4.236 | 0.06 | 0.179 | 5.052 |
| 0.07 | 0.209 | 5.904 | 0.08 | 0.238 | 6.720 |
| 0.09 | 0.268 | 7.560 | 0.1 | 0.298 | 8.412 |
| 0.11 | 0.326 | 9.228 | 0.13 | 0.355 | 10.032 |
| 0.14 | 0.415 | 11.736 | 0.16 | 0.474 | 13.392 |
| 0.18 | 0.534 | 15.096 | 0.2 | 0.593 | 16.752 |

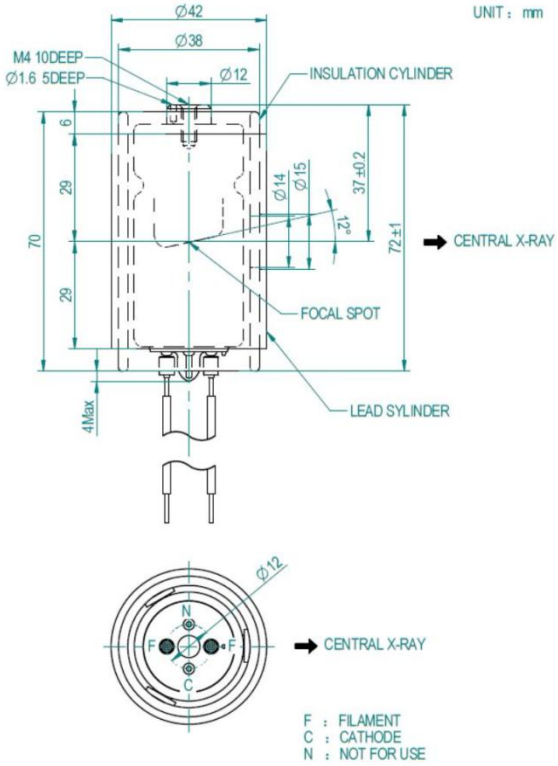
| | | | | | |
|---|---|---|---|---|---|
| 0.22 | 0.652 | 18.420 | 0.25 | 0.742 | 20.952 |
| 0.28 | 0.830 | 23.472 | 0.32 | 0.946 | 26.724 |
| 0.36 | 1.036 | 29.268 | 0.4 | 1.182 | 33.408 |
| 0.45 | 1.328 | 37.536 | 0.5 | 1.476 | 41.712 |
| 0.56 | 1.649 | 46.596 | 0.63 | 1.859 | 52.524 |
| 0.71 | 2.089 | 59.040 | 0.8 | 2.353 | 66.504 |
| 0.9 | 2.648 | 74.844 | 1 | 2.936 | 82.980 |
| 1.1 | 3.233 | 91.356 | 1.25 | 3.673 | 103.800 |
| 1.4 | 4.112 | 116.220 | 1.6 | 4.698 | 132.768 |
| 1.8 | 5.276 | 149.112 | 2 | 5.862 | 165.660 |
| Beam limiting tube | roundϕ60mm | | | | |
| SSD | 200mm | | | | |
| A (cm²) | 28.26 | | | | |
| kV-mA | 70kV 2.5mA | | | | |
| T (s) | dosage mGy | DAP mGy·cm² | T (s) | dosage mGy | DAP mGy·cm² |
| 0.01 | 0.036 | 1.022 | 0.02 | 0.072 | 2.030 |
| 0.03 | 0.108 | 3.053 | 0.04 | 0.144 | 4.075 |
| 0.05 | 0.180 | 5.083 | 0.06 | 0.215 | 6.062 |
| 0.07 | 0.251 | 7.085 | 0.08 | 0.286 | 8.064 |
| 0.09 | 0.322 | 9.072 | 0.1 | 0.358 | 10.094 |
| 0.11 | 0.391 | 11.074 | 0.13 | 0.426 | 12.038 |
| 0.14 | 0.498 | 14.083 | 0.16 | 0.569 | 16.070 |
| 0.18 | 0.641 | 18.115 | 0.2 | 0.712 | 20.102 |
| 0.22 | 0.782 | 22.104 | 0.25 | 0.890 | 25.142 |
| 0.28 | 0.996 | 28.166 | 0.32 | 1.135 | 32.069 |
| 0.36 | 1.243 | 35.122 | 0.4 | 1.418 | 40.090 |
| 0.45 | 1.594 | 45.043 | 0.5 | 1.771 | 50.054 |
| 0.56 | 1.979 | 55.915 | 0.63 | 2.231 | 63.029 |
| 0.71 | 2.507 | 70.848 | 0.8 | 2.824 | 79.805 |
| 0.9 | 3.178 | 89.813 | 1 | 3.523 | 99.576 |
| 1.1 | 3.880 | 109.627 | 1.25 | 4.408 | 124.560 |
| 1.4 | 4.934 | 139.464 | 1.6 | 5.638 | 159.322 |
| 1.8 | 6.331 | 178.934 | 2 | 7.034 | 198.792 |
| Beam limiting tube | roundϕ60mm | | | | |
| SSD | 200mm | | | | |
| A (cm²) | 28.26 | | | | |
| kV-mA | 60kV 3.5mA | | | | |
| T (s) | dosage mGy | DAP mGy·cm² | T (s) | dosage mGy | DAP mGy·cm² |

| | | | | | |
|---|---|---|---|---|---|
| 0.01 | 0.028 | 0.781 | 0.02 | 0.055 | 1.551 |
| 0.03 | 0.083 | 2.332 | 0.04 | 0.110 | 3.113 |
| 0.05 | 0.138 | 3.883 | 0.06 | 0.164 | 4.631 |
| 0.07 | 0.191 | 5.412 | 0.08 | 0.218 | 6.160 |
| 0.09 | 0.245 | 6.930 | 0.1 | 0.273 | 7.711 |
| 0.11 | 0.299 | 8.459 | 0.13 | 0.326 | 9.196 |
| 0.14 | 0.381 | 10.758 | 0.16 | 0.435 | 12.276 |
| 0.18 | 0.490 | 13.838 | 0.2 | 0.543 | 15.356 |
| 0.22 | 0.597 | 16.885 | 0.25 | 0.680 | 19.206 |
| 0.28 | 0.761 | 21.516 | 0.32 | 0.867 | 24.497 |
| 0.36 | 0.949 | 26.829 | 0.4 | 1.084 | 30.624 |
| 0.45 | 1.218 | 34.408 | 0.5 | 1.353 | 38.236 |
| 0.56 | 1.511 | 42.713 | 0.63 | 1.704 | 48.147 |
| 0.71 | 1.915 | 54.120 | 0.8 | 2.157 | 60.962 |
| 0.9 | 2.428 | 68.607 | 1 | 2.692 | 76.065 |
| 1.1 | 2.963 | 83.743 | 1.25 | 3.367 | 95.150 |
| 1.4 | 3.770 | 106.535 | 1.6 | 4.307 | 121.704 |
| 1.8 | 4.837 | 136.686 | 2 | 5.374 | 151.855 |
| Beam limiting tube | roundϕ60mm | | | | |
| SSD | 200mm | | | | |
| A (cm²) | 28.26 | | | | |
| KV-mA | 65kV 3.5mA | | | | |
| T (s) | dosage mGy | DAP mGy·cm² | T (s) | dosage mGy | DAP mGy·cm² |
| 0.01 | 0.033 | 0.937 | 0.02 | 0.066 | 1.861 |
| 0.03 | 0.099 | 2.798 | 0.04 | 0.132 | 3.736 |
| 0.05 | 0.165 | 4.660 | 0.06 | 0.197 | 5.557 |
| 0.07 | 0.230 | 6.494 | 0.08 | 0.262 | 7.392 |
| 0.09 | 0.295 | 8.316 | 0.1 | 0.328 | 9.253 |
| 0.11 | 0.359 | 10.151 | 0.13 | 0.391 | 11.035 |
| 0.14 | 0.457 | 12.910 | 0.16 | 0.521 | 14.731 |
| 0.18 | 0.587 | 16.606 | 0.2 | 0.652 | 18.427 |
| 0.22 | 0.717 | 20.262 | 0.25 | 0.816 | 23.047 |
| 0.28 | 0.913 | 25.819 | 0.32 | 1.041 | 29.396 |
| 0.36 | 1.140 | 32.195 | 0.4 | 1.300 | 36.749 |
| 0.45 | 1.461 | 41.290 | 0.5 | 1.624 | 45.883 |
| 0.56 | 1.814 | 51.256 | 0.63 | 2.045 | 57.776 |
| 0.71 | 2.298 | 64.944 | 0.8 | 2.588 | 73.154 |
| 0.9 | 2.913 | 82.328 | 1 | 3.230 | 91.278 |
| 1.1 | 3.556 | 100.492 | 1.25 | 4.040 | 114.180 |
| 1.4 | 4.523 | 127.842 | 1.6 | 5.168 | 146.045 |

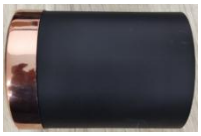
| | | | | | |
|---|---|---|---|---|---|
| 1.8 | 5.804 | 164.023 | 2 | 6.448 | 182.226 |
| Beam limiting tube | round$\phi$60mm | | | | |
| SSD | 200mm | | | | |
| A (cm²) | 28.26 | | | | |
| kV-mA | 70kV 3.5mA | | | | |
| T (s) | dosage mGy | DAP mGy·cm² | T (s) | dosage mGy | DAP mGy·cm² |
| 0.01 | 0.040 | 1.124 | 0.02 | 0.079 | 2.233 |
| 0.03 | 0.119 | 3.358 | 0.04 | 0.158 | 4.483 |
| 0.05 | 0.198 | 5.591 | 0.06 | 0.237 | 6.668 |
| 0.07 | 0.276 | 7.794 | 0.08 | 0.315 | 8.870 |
| 0.09 | 0.354 | 9.979 | 0.1 | 0.394 | 11.103 |
| 0.11 | 0.430 | 12.181 | 0.13 | 0.469 | 13.242 |
| 0.14 | 0.548 | 15.491 | 0.16 | 0.626 | 17.677 |
| 0.18 | 0.705 | 19.927 | 0.2 | 0.783 | 22.112 |
| 0.22 | 0.860 | 24.314 | 0.25 | 0.979 | 27.656 |
| 0.28 | 1.096 | 30.983 | 0.32 | 1.249 | 35.276 |
| 0.36 | 1.367 | 38.634 | 0.4 | 1.560 | 44.099 |
| 0.45 | 1.753 | 49.547 | 0.5 | 1.948 | 55.059 |
| 0.56 | 2.177 | 61.507 | 0.63 | 2.454 | 69.332 |
| 0.71 | 2.758 | 77.933 | 0.8 | 3.106 | 87.786 |
| 0.9 | 3.496 | 98.794 | 1 | 3.875 | 109.534 |
| 1.1 | 4.268 | 120.590 | 1.25 | 4.849 | 137.016 |
| 1.4 | 5.427 | 153.410 | 1.6 | 6.202 | 175.254 |
| 1.8 | 6.964 | 196.827 | 2 | 7.737 | 218.671 |

# 8. Dimensional drawing of X-ray tube components and equipment X-ray tube dimensions



# 9. Accessories list

| order number | Accessories name | Specifications / models | picture | remarks |
|---|---|---|---|---|
| 1 | Handheld dental X-ray machine | K-RH210 |  | |
| 2 | Trained tube | roundΦ60mm<br>length200mm |  | Optional |
| 3 | Charger | / |  | |
| 4 | remote control | / |  | |
| 5 | Reverse shield (lead glass) | / |  | Optional |
| 6 | Hand strap | / |  | |
| 7 | Shoulder strap | / |  | |
| 8 | Quality certificate | / |  | |

# 10. Radiation protection


This Portable dental X-ray machine should only be operated by trained personnel in a controlled environment. In such an environment, ensure that only the patient is in the direct beam of X-rays and that any support personnel are at lea st 2 meters away from the patient. If it is necessary for any support personnel to remain within 2 meters of each other, these personnel should avoid the direct be am and wear personal protective equipment such as radiation-resistant aprons an d thyroid radiation-resistant collars.
This dental X-ray machine can be dangerous to the operator and patient unless safe exposure parameters and operating instructions are followed.

Remember that optimal radiation to the operator exists within the cone-shaped area behind the back scatter shield (the so-called effective occupancy zone). All per sons authorized to operate equipment should be fully aware of the safety recommendations and establishment of maximum permissible doses and adhere to all guidelines set forth in the internal radiation protection plan for pregnant or expectantly pregnant patients and operators. When implementing a radiation protection plan, consult local regulations regarding radiation protection and the use of X-ray equipment. Ensure proper registration and compliance with any such regulations.

Do not operate the dental X-ray machine until the patient and operator are in th e correct position and ready for exposure, thereby reducing the possibility of interruptions and preventing anyone from being inadvertently exposed to X-rays. Do not attempt exposure if anyone is behind the patient (in the direction of the X-ray emission). The current exposure can be terminated for any reason by releasing the trigger button.

WUKONG K-RH210 Protection against unnecessary radiation is provided, but there i s still no practical design that can completely shield the generation of reverse radiation, exposing the operator himself or other personnel to unnecessary radiation. It is important to limit use and comply with all applicable Chinese radiation protection regulations.

## 10.1 Radiation protection measures

Protection for operators:

a) The backscatter shield is located at the top of the beam limiting tube;

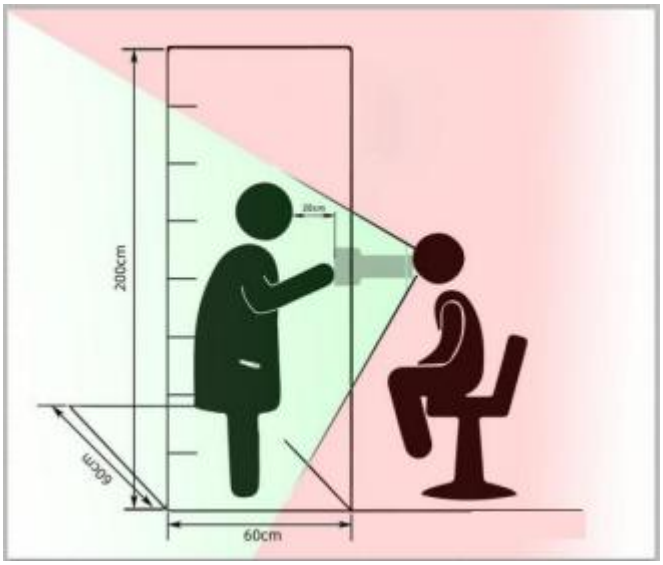
b) The backscatter shield is close to the patient;

c) The patient tilts his/her head when necessary to accommodate the exposure;

d) The operator remains in the effective occupancy area directly behind the equipment shield;

e) In order to increase the radiation protection of operators, it is recommended that operators use protective equipment (lead protective gloves) with a lead equivalent of not less than 0.25mmPb.
The equivalent should not be less than 0.025mmPb to increase radiation protection);

f) The operator should be familiar with and proficient in the operation and use of this equipment to avoid incorrect operations that increase the number of invalid exposures and increase the radiation the operator himself is exposed to. When incorrect operations are discovered, the exposure action should be terminated in a timely manner.




Do not activate the equipment until the patient and operator are in position and ready for exposure to prevent anyone from being inadvertently exposed to X-rays. Do not attempt radiation if anyone other than the patient is in the radiation exposure position. If there are auxiliary personnel assisting in filming, such personnel should wear protective equipment in accordance with radiation protection requirements.

When selecting and using a sensor, preference should be given to models that allow the backscatter shield to remain on top of the beam limiting tube for maxim um operator protection.

The operator can terminate irradiation at any time by releasing the pressed controller in advance.

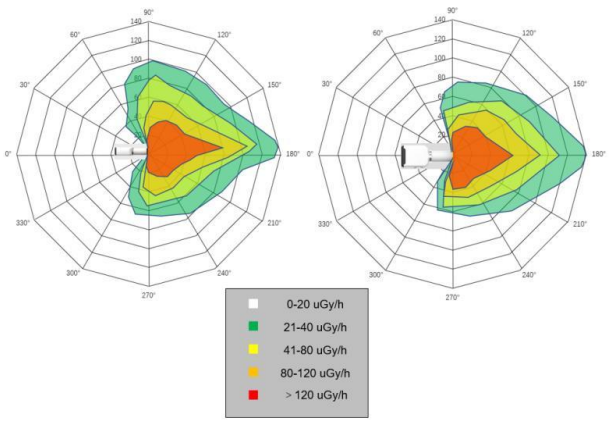
As shown in the figure, when the device is positioned near the patient and perpendicular to the operator (with the patient's head tilted if necessary), and the back scatter shield is fully deployed toward the patient and parallel to the operator, backscatter can be targeted (red area) provides maximum protection (green zone).

| | Correct position | Lean back | close range ope ration | Shield cover slides back |
|---|---|---|---|---|
| Stay within The valid occupied area |  |  |  |  |
| protective effect | maximum | smallest | | |

Operations outside the protected area (or in the case of reduced protected areas) require appropriate precautions, such as the use of radiation-proof aprons and thyroid radiation-proof collars in accordance with China's radiation protection regulations.

Radiation exposure to the operator can be further reduced by using remote expo sure with a remote control to extend the range of the operator's position behind the backscatter shield.

The operator's effective occupancy zone was further verified through in-house testing. The equipment was repeatedly exposed to the water model for 1.00 second s, and radiation readings were recorded at 192 points to determine that the vertical effective occupied area was 60cm×200cm, and the horizontal effective occupied area was 60cm ×60cm.



# 11. Storage and transportation

## Shipping and storage conditions:

1) Storage

• Do not store the device in damp, salty or dusty locations. These conditions may cause operational problems.

• Do not store the device in places where the temperature fluctuates greatly. Do not leave the device in direct sunlight.

• Do not store the device near or around flammable materials or explosive gases.

• Do not connect digital sensors to the main body. Digital sensors are very sensitive devices, so they must be kept in separate holding boxes.

2) Things to note

• Do not expose the device to extreme shock or vibration.

• Do not place the device in a dusty, dirty or tilted location.

• Before using the sensor, keep the sensor covered with a disposable protective film to keep it trouble-free.

3) Reference

• Use equipment according to operating procedures.

• Use equipment in a ventilated area.

• Before attempting cleaning, make sure the electrical outlet is unplugged and the power source is completely disconnected. Use a clean, dry cloth to keep the device clean. Use only non-alcohol disinfectant wipes, or moisten them with liquid or spray.

# 12. Environmental protection

After the equipment life cycle is over, it must be disposed of in accordance with local environmental protection requirements. Disassembly of the equipment must be done by authorized and qualified personnel. The device is mostly made of metallic materials such as aluminum, steel and copper, with minimal plastic, electronic or electrical components. Metal parts can be recycled. The equipment contains some lead and must not be discarded in the environment. It must be recycled and disposed of in accordance with local environmental protection requirements. Electronic components and plastic materials must be separated as special waste.

Solid state high-voltage components must be disposed of in strict accordance wit h the laws and regulations of the local environmental protection department. Please contact the manufacturer's customer service center for related matters, or dispose of it properly according to local garbage collection facilities.

# 13. After-sales service

**Warranty**

***This product has a one-year warranty from the date of purchase.**

- If it is difficult to identify the warranty period, the warranty period starts three months from the manufacturing date.
- For defects in the product itself or poor workmanship, the product will be repaired free of charge or replaced according to the product status.

* Even within the warranty period, if the damage is caused by improper use by the user, it will not be repaired free of charge.

- If the equipment is disassembled without authorization or the label is removed, free repair and maintenance will not be available.

* Repairs performed at places other than designated after-sales service centers or repair points are not covered by the warranty.

- The warranty period will not be extended for products that have undergone free repairs.

**ZHENGZHOU YP DENTAL CO.,LTD warrants that, unless otherwise stated in writing, all parts shall be free from defects in workmanship and materials under normal use and proper maintenance for a period of one year from the date of delivery to the customer.**

If the following situations occur, ZHENGZHOU YP DENTAL CO.,LTD. will not be responsible for any damage, injury or loss caused by the use of this product.

(1) It has been damaged before use or has been misused by the user;

(2) Repaired, changed or modified by personnel other than ZHENGZHOU YP DENTAL CO.,LTD

(3) Failure to install in strict accordance with applicable codes and regulations;

(4) Not installed by an authorized dealer

(5) During the warranty period,ZHENGZHOU YP DENTAL CO.,LTD. is limited to repairing or replacing faulty machines only with products or components.

(6) This warranty is invalid for any product whose serial number has been altered, defaced or deleted.

## Quality control procedures

The kV and mA measurement period of this product is one year.

Hook up the kV and mA test points on the oscilloscope and clamp it to the ground (GND) for testing. The measured KV and mA errors are less than 5%. The reference standards are as follows:

kV Checkpoint (TP 5) = 6 V (oscilloscope) = 60 kV

kV Checkpoint (TP 5) = 6.5 V (oscilloscope) = 65 kV

kV Checkpoint (TP 5) = 7 V (oscilloscope) = 70 kV

mA Checkpoint (TP 6) = 2 V (oscilloscope) = 2 mA

mA Checkpoint (TP 6) = 3 V (oscilloscope) = 3 mA

(The mA detected by the registered version is: 2.5mA, 3.5mA)

# 14. Electromagnetic compatibility

In order to ensure the electromagnetic compatibility of this equipment, this equipment needs to be installed, debugged and used in accordance with the accompanying documents. Portable and mobile radio frequency communication equipment may affect the electromagnetic compatibility of this equipment. If this happens, please contact our company personnel for resolution.

## 14.1 Electromagnetic compatibility

Electromagnetic compatibility refers to the ability of a device to suppress electro magnetic interference from other devices without causing similar electromagnetic radiation interference to other devices. This device may cause electromagnetic interference to other devices through the air or connecting cables.

## 14.2 Solutions to common problems in electromagnetic compatibility

Strictly operate in accordance with the instructions for use of this equipment to ensure the basic working conditions of the equipment without electromagnetic interference.

Keeping other equipment away from the system can reduce electromagnetic interference.

Electromagnetic interference can be reduced by adjusting the relative position/installation angle between this system and other equipment.

Electromagnetic interference can be reduced by rerouting power/signal cables from other devices.

Electromagnetic interference can be reduced by changing the power path of other devices.

## 14.3 Cables and accessories provided with the machine

| Name | Cable length ( m ) | Whether to block | Remark |
|---|---|---|---|
| power cable | 1 | no | / |

## 14.4 Precautions

This equipment can only be connected to the cables mentioned in the accompanying documents. Using accessories and cables other than those specified to connect to this equipment may increase the emission of this equipment or reduce the immunity.

This equipment should not be used close to or stacked with other equipment. If it must be used close to or stacked, it should be observed and verified to operate normally in the configuration in which it is used.

This equipment is not intended for use in a residential environment where it does not provide adequate protection for radio reception.

Even if other equipment complies with the emission requirements of the national standards corresponding to CISPR, the equipment or system may still be interfered by other equipment.

## 14.5 Basic performance of electromagnetic compatibility:

a) The accuracy of the loading factors complies with GB9706.265 Clause 203.6.4.3.102;

b) The repeatability of radiation output complies with GB9706.265 Clause 203.6.3.2

| Guidance and Manufacturer's Statement - Electromagnetic Emissions | | |
|---|---|---|
| The Portable dental X-ray machine is expected to be used in the electromagnetic environment specified below.<br><br>The purchaser or user should ensure that it is used in this electromagnetic environment. | | |
| launch test | Conformity | Electromagnetic environment - guidance |
| RF emissions<br><br>GB4824 | I Group | Portable dental X-ray machines use radio frequency energy only for their internal functions. Therefore, its RF emissions are very low and are less likely to cause interference in nearby electronic equipment |
| RF emissions GB4824-2019 | B kind | The Portable dental X-ray machine is suitable for use in non-domestic and all facilities not directly connected to the public low-voltage power supply network of domestic homes. |
| Harmonic emissions GB17625. 1 | not applicable | |
| Voltage fluctuation/flicker emission GB/T 17625.2 | not applicable | |

| Guidance and Manufacturer's Statement - Electromagnetic Immunity | | | |
|---|---|---|---|
| The Portable dental X-ray machine is expected to be used in the electromagnetic environment specified below.<br>The purchaser or user should ensure that it is used in this electromagnetic environment. | | | |
| Immunity test | IEC60601 test level | compliance level | Electromagnetic environment - guidance |

| | | | |
|---|---|---|---|
| electrostatic discharge GB/T 17626.2 | ±6kV contact discharge<br>±8kV air discharge | ±6kV contact discharge<br>±8kV air discharge | Floors should be wood, concrete or ceramic tiles, and if the floors are covered with synthetic materials, the relative humidity should be at least 30% |
| electrical fast transient burst GB/T 17626.4 | ±2kV to power cord<br>± 1kV pair of input/output lines | ±2kV to power cord<br>± 1kV pair of input/output lines | Mains power should be of a quality typically used in a commercial or hospital environment |
| surge<br>GB/T 17626.5 | ± 1kV wire to wire<br>±2kV line to ground | ± 1kV wire to wire<br>not applicable | The mains power supply should be of a quality typical for use in a commercial or hospital environment. If the user of the Portable dental X-ray machine requires continuous operation during a power outage, it is recommended that the Portable dental X-ray machine be powered by an uninterruptible power supply or a battery. |
| Voltage sags, short interruptions and voltage changes on power input lines GB/T17626. 11 | ＜5% UT ， Lasts for 0.5 cycles<br>40% UT ， Lasts 5 cycles<br>70% UT，Lasts 25 cycles<br>＜5% UT ， Lasts 5s | ＜5% UT ， Lasts for 0.5 cycles<br>40% UT ， Lasts 5 cycles<br>70% UT，Lasts 25 cycles<br>＜5% UT ， Lasts 5s | Power frequency magnetic fields should have power frequency magnetic field level characteristics typical of a typical location in a typical commercial or hospital environment. |
| Power frequency magnetic field (50Hz ) GB/T17626.8 | 3A/m | 3A/m | Power frequency magnetic fields should have power frequency magnetic field level characteristics typical of a typical location in a typical commercial or hospital environment. |

| | | | |
|---|---|---|---|
| Note: UT refers to the AC network voltage before the test voltage is applied. | | | |
| Guidance and Manufacturer's Statement - Electromagnetic Immunity | | | |
| The Portable dental X-ray machine is expected to be used in the electromagnetic environment specified below.<br><br>The purchaser or user should ensure that it is used in this electromagnetic environment. | | | |
| RF conduction<br>GB/T17626.6-2017 | 3V (Valid values )<br>150kHz-80MHz | 3V<br><br>150kHz-80MHz | Portable and mobile RF communications equipment should not be used closer than the recommended isolation distance to any part of a Portable dental X-ray machine, including cables. This distance should be calculated by the formula corresponding to the transmitter frequency<br>d=1.2 $\sqrt{P}$ |
| Radio frequency<br><br>radiation | 3V/m<br><br>80MHz-2.5GHz | 3V/m<br><br>80MHz-2.5GHz | d =1.2 80MHz-800MHz<br>d $\sqrt{P}$ 800MHz-2.5GHz<br>$\sqrt{P}$ =2.3 |
| GB/T17626.3-2016 | | | |

| | | | |
|---|---|---|---|
| | | | 式中：<br>P ——Maximum rated output power of the transmitter in watts according to the transmitter manufacturer (W)；<br>d ——Recommended isolation distance in meters (m)；<br>The field strength of fixed RF transmitters is determined by an electromagnetic field surveya and should be lower than the compliance level in each frequency range.<br>Interference may occur in the vicinity of equi pment marked with the following symbol.<br>  |

Note 1: At the 80MHz and 800MHz frequency points, the formula for the higher frequency band is used.
Note 2: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by absorption and reflection from buildings, objects and human bodies.

a. The field strengths of fixed transmitters, such as base stations for wireless (cellular/cordless) telephones and land mobile radios, amateur radios, AM and FM radio broadcasts, and television broadcasts, cannot be accurately predicted theoretically. To assess the electromagnetic environment of fixed RF transmitters, a survey of the electromagnetic field should be considered. If the measured field strength in the location where the Portable dental X-ray machine is located is higher than the applicable RF compliance level above, the Portable dental X-ray machine should be observed to verify its normal operation. If abnormal performance is observed, additional measures may be necessary, such as

reorienting or relocating the Portable dental X-ray machine.

b. In the entire frequency range of 150kHz~80MHz, the field strength should be lower than 3V/m.

Recommended isolation distances between portable and mobile radio frequency communications equipment and Portable dental X-ray machines

Portable dental X-ray machine intended for use in an electromagnetic environment with controlled radio frequency radiation disturbance. Based on the maximum rated output power of the communication equipment, the purchaser or user can prevent electromagnetic interference by maintaining the minimum distance recommended below between portable and mobile radio frequency communication equipment (transmitters) and Portable dental X-ray machines.

| Maximum rated output power of the transmitter W | Corresponding to the isolation distance of different frequencies of the transmitter/m | | |
|---|---|---|---|
| | 150kHz-80MHz $d=1.2\sqrt{P}$ | 80MHz-800MHz $d=1.2\sqrt{P}$ | 800MHz-2.5GHz $d=2.3\sqrt{P}$ |
| 0.01 | 0. 12 | 0. 12 | 0.23 |
| 0.1 | 0.38 | 0.38 | 0.73 |
| 1 | 1.2 | 1.2 | 2.3 |
| 10 | 3.79 | 3.79 | 7.27 |
| 100 | 12 | 12 | 23 |

For the maximum rated output power of the transmitter not listed in the above table, the recommended isolation distance d, in meters (m), can be determined by the formula in the corresponding transmitter frequency column, where P is the transmitter provided by the transmitter manufacturer. The maximum rated output power of the machine, in watts (W).

Note 1: At the 80MHz and 800MHz frequency points, the formula for the higher frequency range is used.

Note 2: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by absorption and reflection from buildings, objects and human bodies.

# 15. Symbol Description

| | |
|---|---|
|  | ATTENTION! Failure to comply may result in damage to the device or injury to t he user and/or patient. |
|  | Ionizing Radiation Warning |
|  | Protective grounding |
|  | ground |
|  | alternating current |
|  | direct current |
|  | Class II equipment |
|  | Exposure button logo |
|  | switch |
|  | Instructions. Before using the device, please refer to the accompanying documentation. |
|  | Be sure to refer to the user manual. |
|  | No stampeding |
| SN | Product Serial Number |
|  | manufacturer |
|  | Manufacturing date |