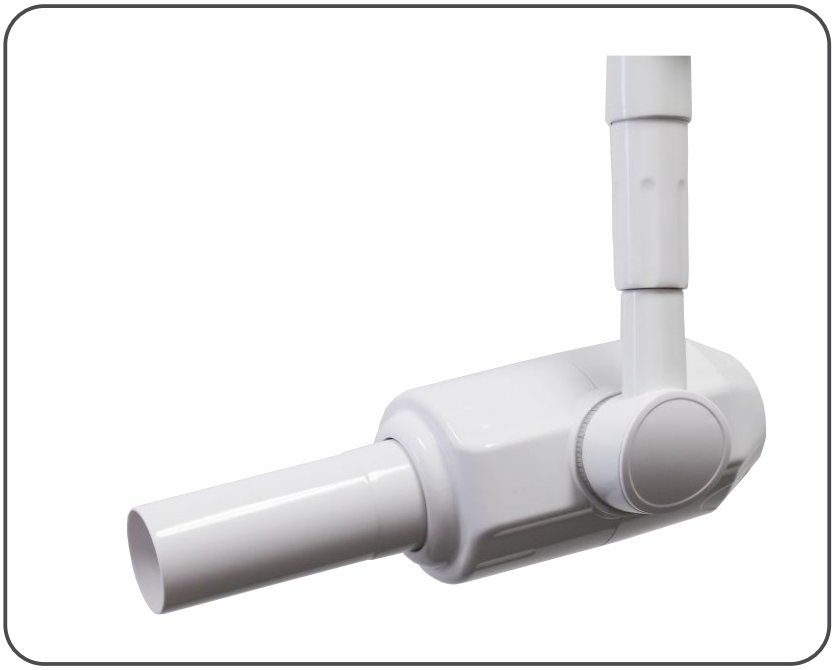
XZeal Technologies, Inc.

Dental X-Ray Unit Z70

70kVp - 7mA



User´s Manual

Mobile Model

Quality is our hallmark

Dear Customer,

Thank you for buying the XZeal Dental X-Ray unit.

Before using the XZeal X-Ray Unit, please fill the Warranty Certificate attached and send back to the factory. Thia register will be validating your product Warranty.

Before operating, please read carefully all safety cautions and instructions for operation. This User´s Manual will help you understand all functions of this XZeal X-Ray unit as much as possible.

There is available in this Manual the XZeal X-Ray unit Mobile Model Z70(M).

Please, before the use, read carefully all the instructions of this User's Manual while, using, servicing and maintaining the units.

Please keep this Manual for your future references.

If error occurs during operation of the equipment please get in touch with your local Dealer to receive the proper service and assistance.

The Warranty terms are according the Warranty Certificate (Part of this Manual).

This Manual is only for use and operations purposes. The Installation Manual will be provided only to specialized technicians. Dentists and final users are not authorized to install this product.

Refer to complete Manual and Instructions

Table of Contents

OPERATION

1. Introduction

1.1. Indications for Use

The device is an X-Ray generator that provides the radiation necessary for the formation of a radiographic image from which a radiographic diagnosis may be made.

1.2. Main equipment parts

X Ray Tube head, Timer, Arms and base - fixation support according the model (Structure)

1.3. Product Specification´s

- Electric Discharge Protection: Class 1, type B type equipment
- CE-MDD: Class IIb
- FDA: Class II, Code EHD and regulation number 872.1800
- Water Proof Protection: IPX0 (Standard Equipment)

Applicable Standards

The XZeal Z70 Mobile, comply with the following standards:

- DHHS Performance Standard FDA 21 CFR Subchapter J
- IEC EN 60601-1:2006 + AC:2010
- IEC EN 60601-2:2007 + AC:2010
- IEC EN 60601-3:2008 + AC:2010
- IEC EN 60601-28: 2010
- IEC EN 60601-2-65:2012

1.4. Obligation of the installer ⚠

- Make sure the voltage is accorded with the manufacturer requirements and range
- Make sure the switch can cut off the power supply when x-ray working to ensure safety
- Install and test the x-ray according to the Installation Manual (technicians only)provided by manufacturer
- Provide Operation Manual to the final users
- **Follow all the instructions inside this Manual. XZeal Technologies, Inc. is not responsible for any injury caused by improper installation or use**

1.5. Obligation of the user - User's notice ⚠

- Use the equipment according to this User´s Manual
- Maintain the equipment according to the maintenance timetable suggested by the manufacturer. If the equipment is not properly maintained by the Users , the Manufacturer and the dealer will not respond for any accident caused by incorrect operation
- If some accident happens during the equipment operation and result in death, hurt or healthy damage, please inform immediately the responsible governmental department, manufacturer and dealer
- The user must inform the part number and serial number described on the Labels, in case it is necessary information about the product

- Follow all the instructions of this Manual. XZeal Technologies, Inc. is not responsible for any injury caused by badly or inadequate use of this product

1.6. Use Warning ⚠

This X-Ray equipment produces ionization radiation which might damage healthy when operated incorrectly. Only well trained professional can operate the equipment according this Manual and current legislation. Be careful during the Arms and Tubehead operating. The rotative moviments can hurt the hands and/or fingers.

- Even if compliant to specifications of electromagnetic compatibility, it is recommended not to use the equipment in presence of external electromagnetic fields, such as those generated by cellular phones, which might interfere with the electronic circuits of the system.
- The User takes legal responsibility on the possession, installation and use of the equipment
- The equipment is not designed to be used in the presence of flammable anesthetics, oxygen or nitrous oxide
- To protect the patient from X-Ray, radiation protection accessories, such as standard leaded aprons must be used
  A front leaded apron should cover the patient down to mid-thigh. A thyroid apron should also be used. For children, appropriately sized shielding devices should be used, including a front apron and an adjustable thyroid/neck protector

2. Technical Data

2.1. Technical Specifications

- Voltage: 120 or 230 VAC ±10% - Single phase voltage + ground
- Frequency: 50/60 Hz
- Electric current: 8A (120V) or 4A(230V)
- Max power consumption: 0.9 kW
- Fuse: 10A (120V) or 6.3 A (230V) Line and 500 mA board protection
- Focus: 0.7mm X 0,7mm (IEC 60336)
- Anodic X-Ray tube angle: 16°
- Tube voltage: 70kVp ±10%
- Anodic electric current: 7mA ±15%
- Duty cycle: 1/30 sec
- Total Filtration: ≥ 2,1mmAL/Equiv./70kV
- Inherent Filtration: ≥ 0.5mmAL
- HVL: ≥1.5mmAL/70kV
- Leaking radiation: <0.25mGy/h@1.000mm (measured 70kV/7mA/2.5sec exposition)
- X-Ray tube model: TOSHIBA D-0712
- Beam Limit Device SSD (Skin source distance): 22cm (8.5/8'')
- Output radiation field (diameter): ≤ Ø 6cm (2.3/8")

2.2. Timer Characteristics

- 120 or 230 VAC ±10%
- Microprocessor-based controller
- Set exposure time (0.06s-2.50s) automatically through object selection
- Manually set exposure time, range from 0.06s-2.50s according pre-set table
- Patient (small), Patient (large), automatic digital selection
- Manual switch with 3mts (118.11") coiled cable
- Pre-heating* time is between 0.10 and 0.30 seconds, added individually in each equipment
- The accuracy time is ±10%

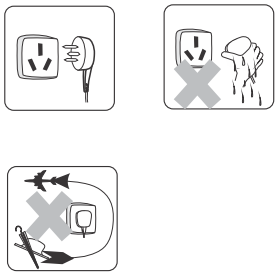
Required time by the tube to enable the correct radiation output, while the filament of the X-Ray tube is pre-heating

3. Operation Instructions

3.1. Overview

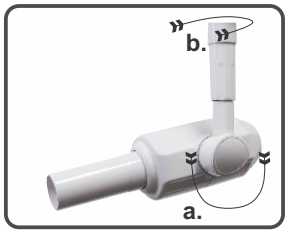
Important information of safe operation ⚠

1. Plug the power cord in an AC120V or 230V (according the equipment voltage) electrical socket Don't use electrical outlets other than the correct voltage; otherwise it might cause fire or electric shock.
2. Don't wet your hand before plugging or unplugging the power cord
3. Unplug the power cord when the equipment is not in use for a long period



A. Tubehead Handling

The tubehead rotation angle can be adjusted at the horizontal and vertical, with the maximum moviment degrees:

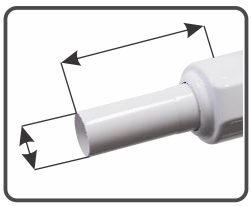


a. Vertical - ±135° (<u>with limited moviment</u>)
b. Horizontal - ±360° (<u>with limited movement</u>)

WARNING ⚠

<u>Both moviments are not free rotate</u>. <u>Respect the limits and the indicative label!</u>

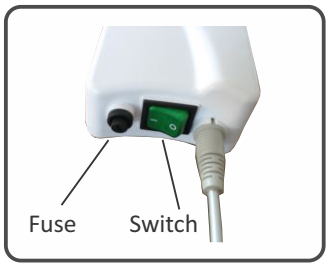
B. Beam Limiting Device



The X-Ray system is equipped with a Beam Limiting Device. The distance between the focal spot (X-Ray) and patient skin is 22cm(8.5/8").
The output radiation field is circular and the diameter is ≤ Ø 6cm (2.3/8").

Note: **Rectangular Collimator** - This collimator type reduce the radiation field. The equipment Z70 haven´t the rectangular collimator. However, this part can be acquired in the American market, from the company Tru-Align™ (www.trualign.com) and installed easily on the Z70 Beam Limiting Device, accord manufacturer instructions.

C. Timer Box and Control



Mobile Model

Haldheld Control

D. Handheld Control

The timer parts are: handheld control and the control box.
There are seven buttons on the handheld control as following:
Large , Small, time Increase(▲) ,time decrease(▼), set up button(SET),Film select key (Film), exposure button. For the symbols instruction, please refer to the Appendix section

Following are the 2 main functions of timer:

1. Self-Inspection function

All of the indicating leds and the display will blink three times when you tum on. Then the device will enter into self-inspection program after beep. This operation can test if the function of indicating if the leds, display and buzzer are normal.

2. Voltage Surveillance function:

This function is to protect the equipment and will inspects if the voltage of the electric network is between 108V and 132V (for 120V configuration) and 207V and 253V (for 230V configuration). When the voltage is under this range the display will show an error code **P1**. If over it will show an error code **P2**.

3.2. Equipment Operation

Follow the instructions below:

1. Turn on the main switch under the Box Timer

2. Adjust the position of tubehead and the direction of beam limiting device

3. Choose on the handheld control, the exposure option: pre-programmed or manual use and so, prepare the exposure, according the parameters below:

a. Choose the low-speed film(D),high-speed film(E/F) or digital sensor (RVG) with "FILM" key . The pre-set is "E/F" and the indicator LED will light on. Different films type and brand could have different radiograph results. The user can adjust the exposure time according to it´s dental film

b. Choosing default exposure: The control will default the program of Large Patient Group 1. At this time you can push Large Patient button to choose the tooth group. The indicating led will be showing your choice. For Small Patient, the operation is the same as above, using the proper button

c. Exposure time selection: There is a 0.32 sec default exposure time for films mode and 0.06 sec for RGV mode. If does not meet the use request, it can be adjusted with manual mode, using the buttons "time UP (2)"and "time DOWN (3)", adjustable between 0.06sec and 2.50 sec.
Follow the time table below:

Handset Manual Times (sec.)*¹ and Doses (mR)*²													
Time	**0.06**	**0.08**	**0.10**	**0.12**	**0.16**	**0.20**	**0.28**	**0.32**	**0.35**	**0.40**	**0.45**	**0.50**	**0.56**
Dose	26	35	43	54	72	90	139	156	167	202	237	264	291
Time	**0.63**	**0.71**	**0.79**	**0.89**	**1.00**	**1.12**	**1.26**	**1.41**	**1.58**	**1.78**	**2.00**	**2.24**	**2.50**
Dose	329	370	408	475	538	610	678	747	842	949	1060	1200	1327

Note*¹:. Using the RVG mode, when necessary the times adjustment, it should be made in a manual way through the time buttons
Dose*²: It is a Guideline, based in a found average of Z70 acting.

d. Taking the timer control, choose and set a position according the patient and the use necessity. Once adjusted, push the exposure button, keeping pressed until the end of the X-Ray exposition time

e. During the X-Ray exposure period, the yellow LED and the buzzer will be indicating the X-Ray exposure.

WARNING: ⚠

During the exposure, the X-Ray button must be kept pressed until the end of the exposition. If the patient move during the X-Ray, the button must be released, thereby, interrupting the emission.

f. The display segments will blink after the exposure. Push any button during this period will be invalid. This period is for the X-Ray tube cooling time. The blinking time will be 30 times of exposure time (1/30 duty cycle).

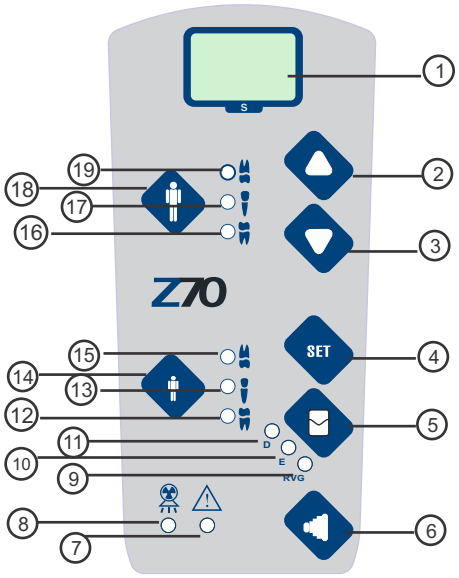
g. Put back the handheld control at the support.

WARNING: ⚠

During the process of exposure ,the yellow LED on the control panel will be illuminated and the buzzer will be beeping. This means the X-Ray is radiating .If it find any alarm code during this procedure, refer at the Appendix 3.2 for the resolution.

Note: To access the function´s with the button "SET", press it during 5 seconds to current net voltage and Software Version.

Handheld Control Overview



Function´s:

1- Display
2- Time Up
3- Time Down
4- SET
5- Exposure Type Selector: Type D, E or RGV
6- X-Ray shot
7- Red alert led
8- Yellow X-Ray expos. led
9- RGV position
10- Film type E
11- Film type D
12- Tooth Group 3 (Small)
13- Tooth Group 2 (Small)
14- Small Patient Selector
15- Tooth Group 1 (Small)
16- Tooth Group 3 (Large)
17- Tooth Group 2 (Large)
18- Large Patient Selector
19- Tooth Group 1 (Large)

Exposition Table
Pre-Set Times and Radiation Doses

Small		Large		Gr	Tooth	Film
Time*1 (sec)	Dose*2 (mR)	Time (sec)	Dose (mR)			
0.35	167	**0.50**	264	**1**		**D**
0.28	139	**0.40**	202	**2**		**D**
0.32	156	**0.45**	237	**3**		**D**
0.28	139	**0.35**	167	**1**		**E**
0.20	90	**0.28**	139	**2**		**E**
0.20	90	**0.32**	156	**3**		**E**

Exposition Time Table and Doses

WARNING:

The Pre-Set times*1 are only referential and they can change in function of factors as, quality of the film, solutions, development, patient structure and radiographic technique.
The insert and adjustment of times in a manual way is available.
We consider Large, patients with more than 100 lbs. (45 kgs) and Small, patients with less then 100 lbs. (45 kgs).

Dose*2: It is a Guideline, based in a found average of Z70 acting

3.3. Equipment Safety

A. Electrical Shock Hazard

- Only a trained and certified technician can open the timer and touch the electric circuit
- The equipment electrical installation must be according with the safety regulations and with grounding protection
- Make sure keep the equipment disconnected from the any electrical power supply during the installation, maintenance, transport and sterilization of the unit

B. ESD Warning

When managing PCB boards, permanent damage may occur on device subject to high energy electrostatic discharges. When handling the equipment boards, use the proper ESD equipment to avoid electrostatic damages

C. Protection Against Explosion

The X-Ray equipment must not be used in the presence of desinfectants, flammable or potentially explosive gases and vapors that might catch fire and cause damage
In case these disinfectants have to be used, let the vapors completely disperse before turning on the X-Ray equipment

D. Mechanical Risk

- After the installation, check with the technician the equipment assembly and support, respecting all specifications of this Manual
- The internal arm spring is under high pressure. Be carefull when handling the arms to avoid any injurie
- Make sure the equipment during the adjust position won´t nip the finger from the patient or operator

E. Protection Against Radiation

- The local of equipment installation must be in compliance with the local standards, for the operator, patient and othe persons protection against radiation
- The Z70 unit must be used in compliance with the local standards concerning radiation protection
- During the examination, all personnel must comply with safety regulations concerning protection against radiation. For the operator safety, keep at least 2 meters (6.5 fts) from the X-Ray source
- Only qualified personnel and for the intended use must operate the equipment
- The operator must be responsible for the patient protection against unnecessary or excessive radiation doses
- Protection devices as apron and thyroid collar are required to protect the patient from radiation

3.4. Disposal - Enviroment

For disposal the equipment, contact the local authorities for informations. Proper disposal of this product will help protect the enviroment

3.5. Equipment Cleaning

- Turn off and disconnect the equipment from the main electrical power supply before cleaning
- Do not spray any liquid/product directly on the device
- The Z70 is not waterproof. Use a soft fabric with the cleaning not saturated solution

3.6. Equipment Infection Control and Desinfection

- Infection Control - Protect the system from contamination using barriers membrane/sleeves/ sheets on the parts with operator and/or patient contact, available from TotalCare™ or Dental Distributors
- Disinfection - The equipment can be cleaned and/or disinfected using the solution [Disobutyl Phenoxethoxycthil Dimethyl Benzyl Ammonium Chloride]
  NOTE: Do not use solvent or caustic disinfect

3.7. Equipment Maintenance

The equipment requires proper operation, periodic maintenance and servicing. The following precautions will ensure safe and effective functioning of the system.
Periodic maintenance consists of system checks directly performed by the operator and/or by Technical Service.

Items to be checked:

- Check if all product labels are proper in place
- Check if the Tubehead is free from oil residues
- Check if coiled cable and X-Ray button are not broken and working properly
- Check for external damage in the Tubehead cover
- Check for the arm balancing (Up and Down)
- Check (in case wall model) if the screws from the wall support and or wall plate are proper installed
- Check (in case wall model) if the vertical alignment of the wall plate/support is on level
- Check (in case mobile model) if all base screw are well fixed
- Check if all equipment rotate limit are working properly

The checking should be performed before any operation session. In case of irregularities, contact immediatly the Technical Service.

3.8. Equipment Test

After the product installation (technicians only), test all product functions, following all steps described in this Manual. If there are some doubt, enter immediatly in contact with the Technical Service Support

3.9. Equipment Transportation and Storage Condition

- Environmental temperatura: - 20°C (- 4° F) ~ + 55° C (131° F)
- Relative humidity:10% ~ 80%
- Atmospheric pressure: 500HPa ~ 1060HPa

Warning ⚠

- The equipment should be stored in a dry, airy and free of impurities
- Do not expose the equipment to strong vibrations

3.10. Equipment Use

- Allow enough space for the product use and operation
- Do not hang objects on the equipment
- For legal effects, the useful life of the product is 5 years from date of manufacture

MOBILE MODEL

4. Mobile Overview

4.1. Overview

The characteristic of Z70(M)is mobile .Inspect if the spare parts equipped with the equipment are complete and in perfect conditions before the installation. If you have any question please get in contact with the XZeal Technical Service Support.

The x-ray equipment must be installed only by a specialized Technician. The XZeal do not supply the necessary tools for the installation.

Warning ⚠

XZeal Technologies, Inc. is not responsible for any damage or injurie to the equipment, operator or the patient, caused by the incorrect use, operation, installation and maintenance procedures that are not described in this User´s Manual.

The XZeal Dental X-Ray Z70 (Fig.01) consists of:

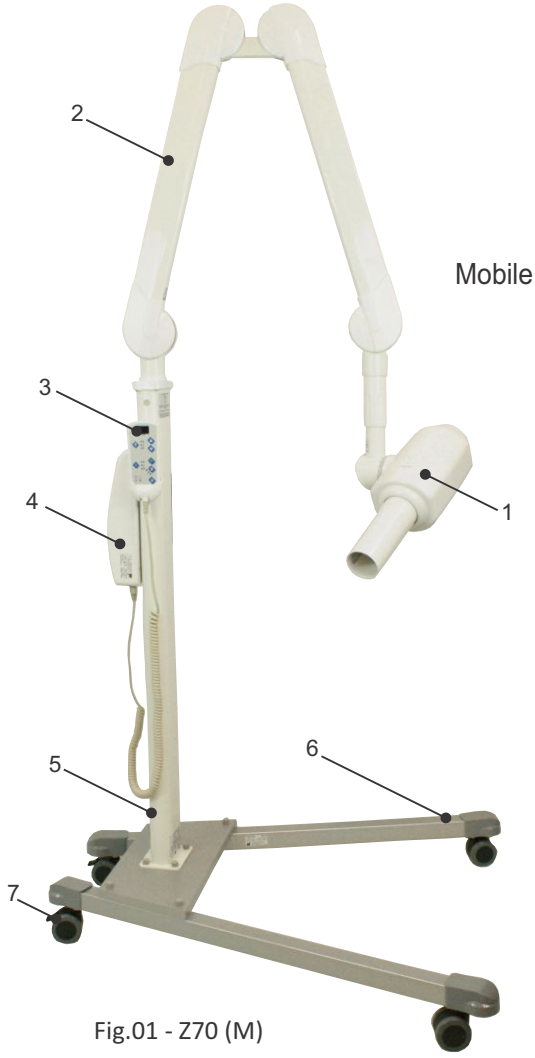


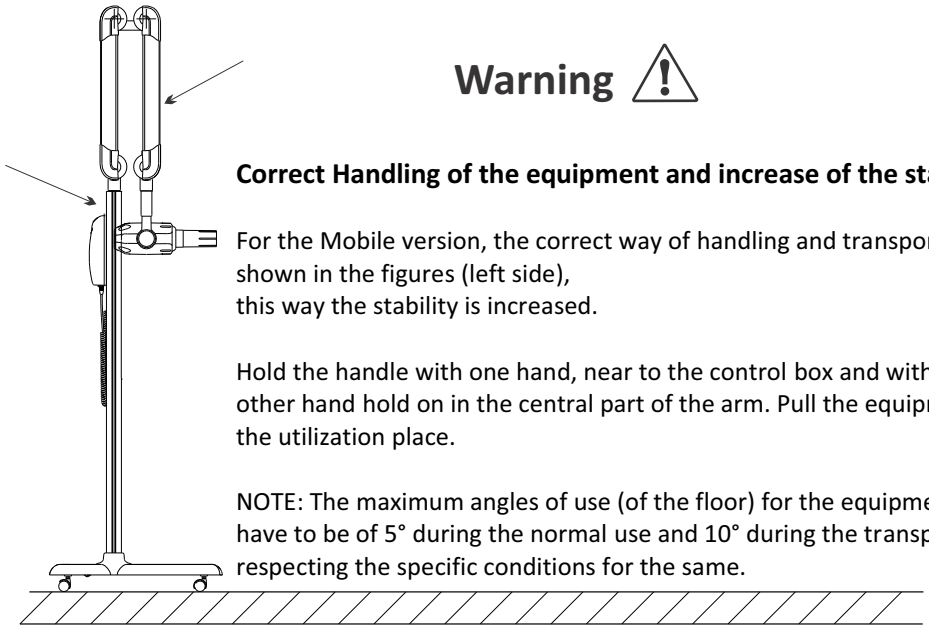
Fig.01 - Z70 (M)

Mobile Overview

Product Configuration

1.Tubehead
2. Folding Arm
3. Handheld Control
4. Main Timer
5. Column
6. Base
7. Casters

4.2. Handling and Measures - Z70 (M)



Warning ⚠

Correct Handling of the equipment and increase of the stability

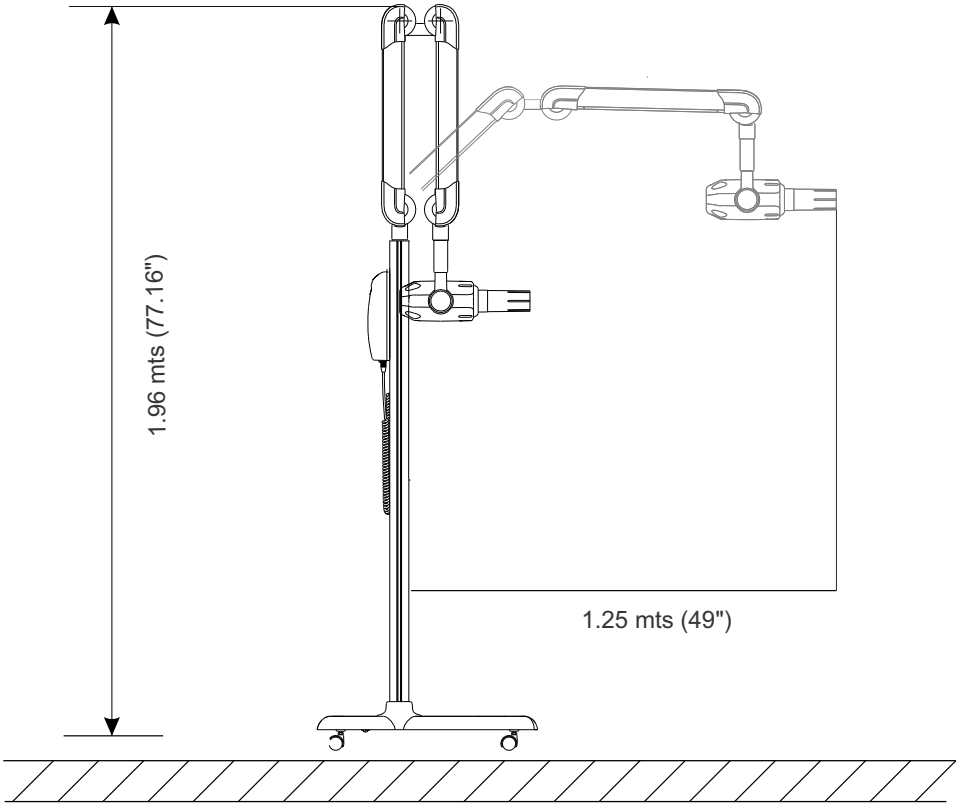
For the Mobile version, the correct way of handling and transporting is shown in the figures (left side),
this way the stability is increased.

Hold the handle with one hand, near to the control box and with the other hand hold on in the central part of the arm. Pull the equipment for the utilization place.

NOTE: The maximum angles of use (of the floor) for the equipment will have to be of 5° during the normal use and 10° during the transport, respecting the specific conditions for the same.

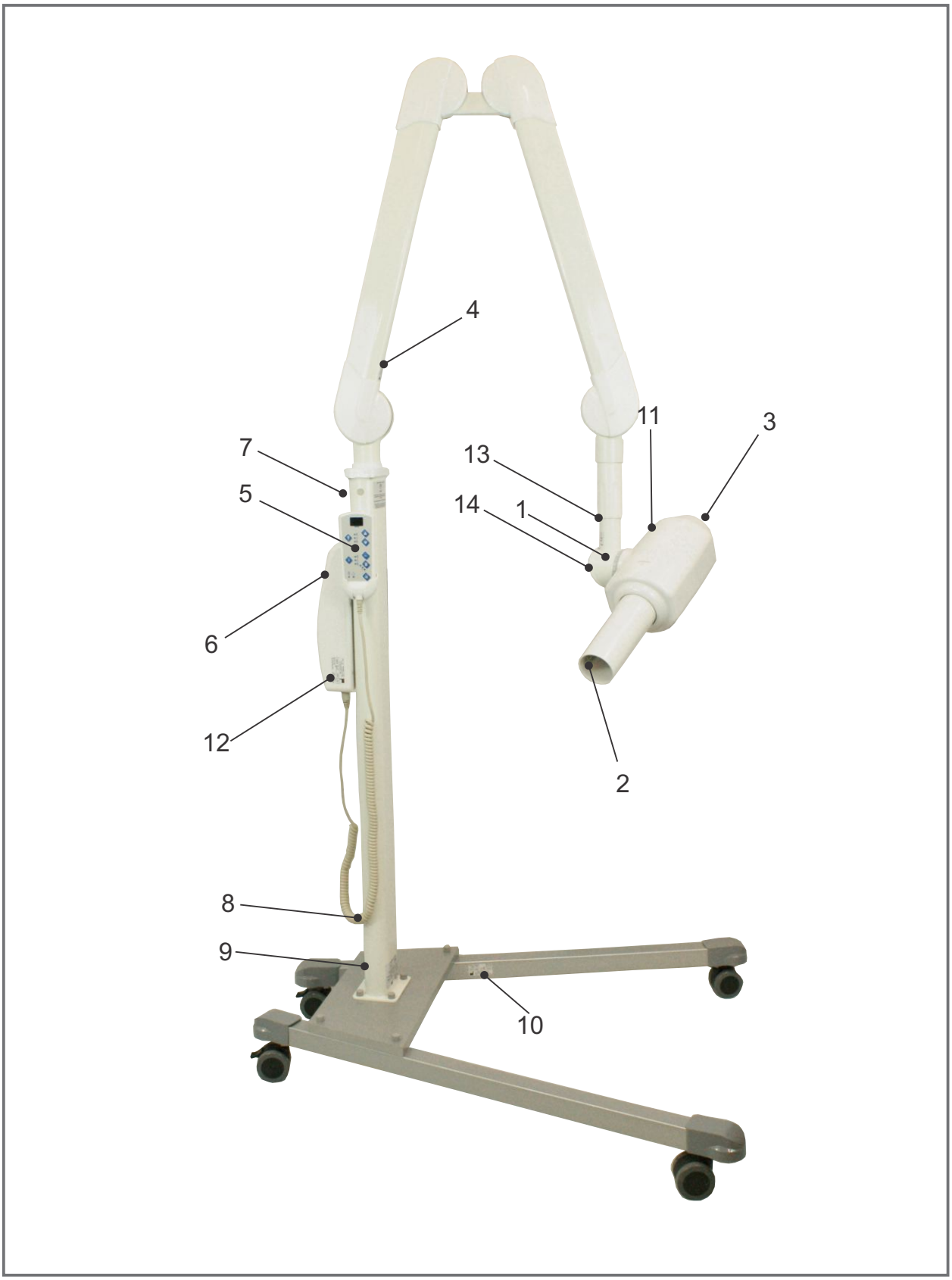
Z70 Working Measures

XZeal recomends a minimum work measure for the mobile unit:
Diameter: 1.60 mts (63.38") and height: 2.20 mts (86.61")

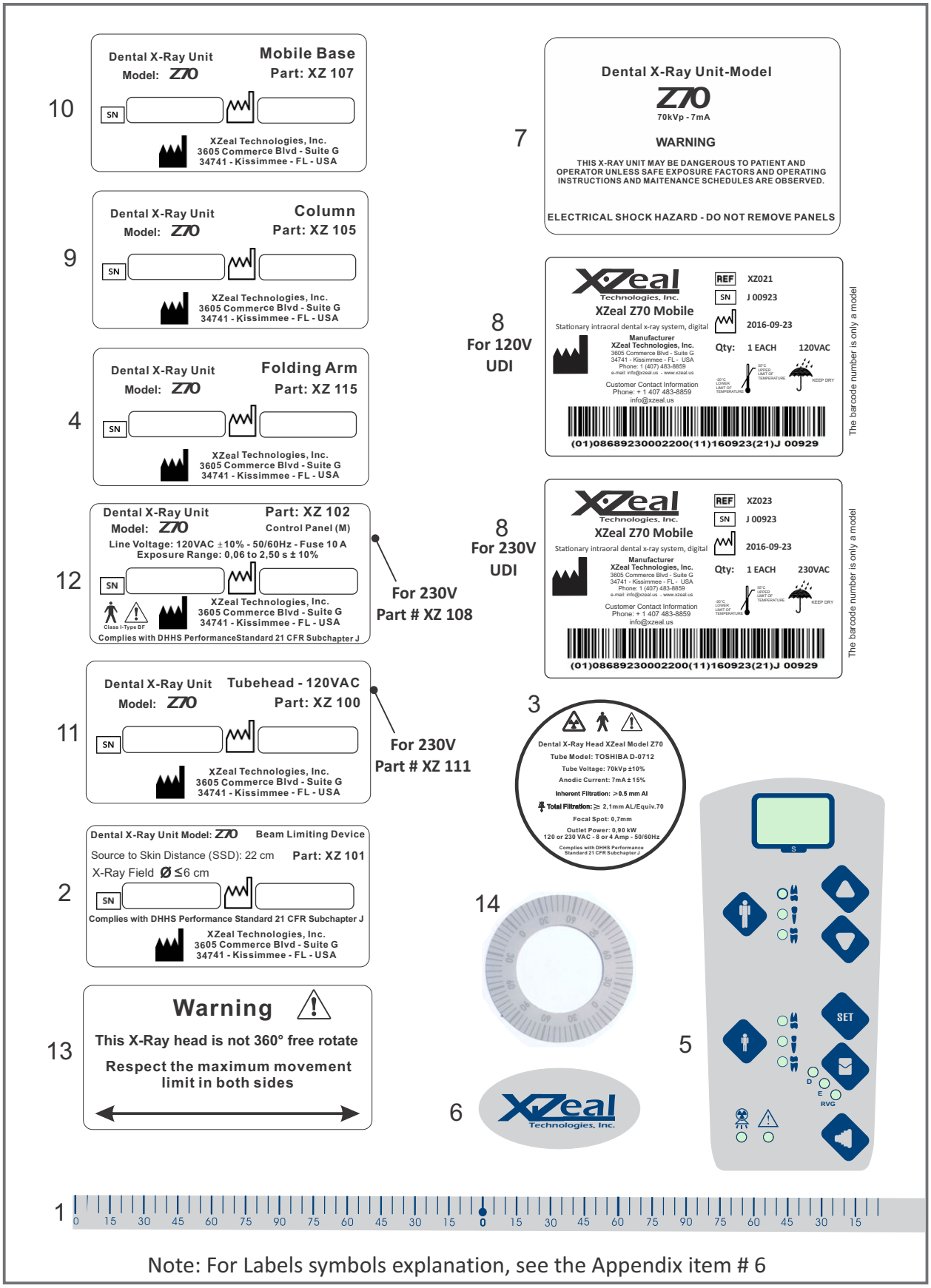


4.3. Labeling Location´s - Z70 Mobile (M)

A. Labeling Location´s Overview

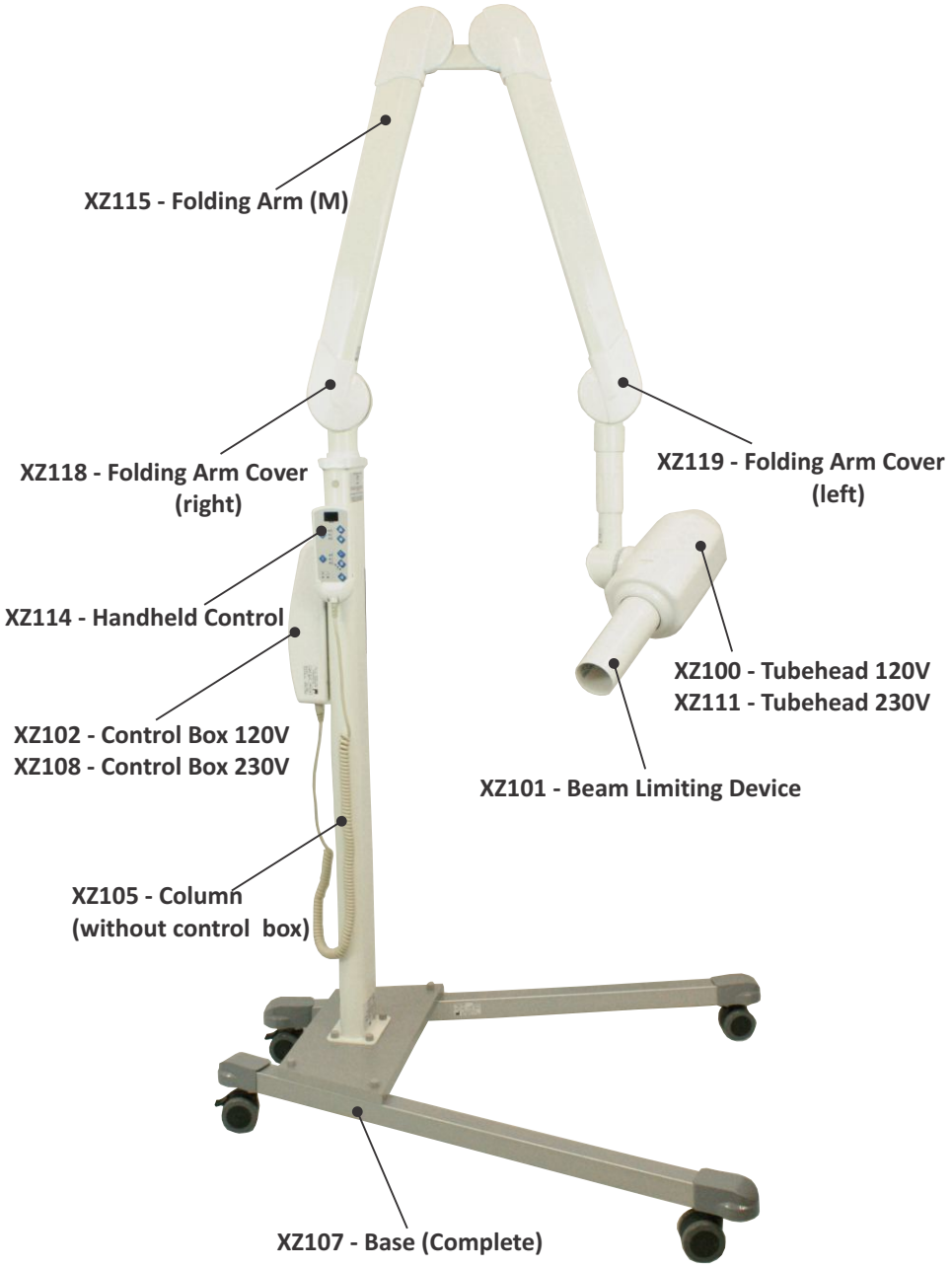


B. Labels Z70 Mobile (M) - Details



Note: For Labels symbols explanation, see the Appendix item # 6

4.4. Z70 Mobile (M) - Main Parts Number



For more Z70 Mobile (M) parts number, ask the Maintenance Department

5. Additional Information's

5.1. Electrical Installation Requirements

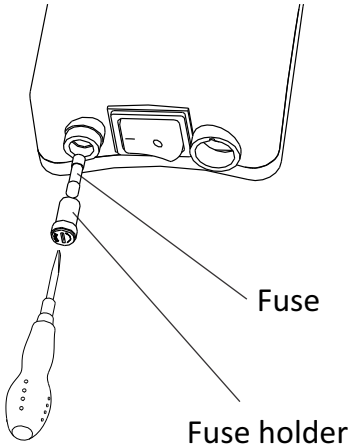
Follow the requerements from the table below, when the technician installing the Z70:

Electrical Power Requirements The system requires a three-wire electrician-supplied power supply. The three-wires provide two power lines (L) Line and (N) Neutral and a (G) Ground. Refer to template for recommended AC main box location. *** Information considered for 120V. For 230V, consult the XZeal.**	Line Voltage* 120 VAC ±10% Main Fuse 10 AMP Circuit Breaker 15 AMP
Wire length and gauge requirements Maximum length of wire and minimum gauge wire (AWG) from the power panel box to the Base unit. Accomplish with the local electrical regulations law. Avoid malfunction, risks and injuries, using an effective ground.	0-50 feet 14 gauge minimum 50-100 feet 12 gauge minimum 100-150 feet 10 gauge minimum 150-250 feet 8 gauge minimum 250-400 feet 6 gauge minimum

5.2. Fuses Replacement

Replacing the Main Fuses

When necessary, the main power supply fuses must be changed, according the Fig.02, below. The fuse characteristics are described at the pag.04, item 2.1.



Mobile Model

Fig.02

APPENDIX

6. Symbols

Symbol	Description	Symbol	Description
	Emitting X-Ray equipment (IEC 60417)		Manufacture location
	Ionizing radiation hazard		Manufacture date
	Time UP	SN	Serial number
	Time Down		Hazardous Voltage
	Set configuration´s		Attention, refer to the attached documents
	Radiograph type mode	L	Mains Hot Wire
	Buzzer – X-Ray command	N	Mains Neutral Wire
	Patient Large	O	Power OFF (En IEC 60417)
	Patient Small	I	Power ON (En IEC 60417)
	Tooth Gr 01 – Pre-molar and molar maxillary		Protective Earth (En IEC 60417)
	Tooth GR 02 – Incisive and canine mandible and anterior Bitewing		Comply with the implementation stardards in your country Disposal - Enviroment
	Tooth GR 03 – Incisive, molar, pre-molar and canine maxillary and superior Bitewing	●	Focal point
RVG	X-Ray Sensor		Maximum piling up
D	Film type D		Fragile
E	Film type E/F		Superior face in this direction
	Class I Type B – Applied Part (En IEC 60601-1)		Temperature limits
	X-Ray aluminum filtration		Protect against humidity
	Electrostatic discharge sensitive device		**This symbol remind that is mandatory ready carefully the whole documentation and manual provided with the medical device before perform whatever operation.**

7. Error Codes

Code	Description	Signal	Operation	Solution
P1	The voltage of power is lower than exposure voltage	Red alarm lamp is on/The LED display error code P1	Prohibit any operation	Waiting for automatic restoration after voltage restoration
P2	The voltage of power is higher than exposure voltage	Red alarm lamp is on/The LED display error code P2	Prohibit any operation	Waiting for automatic restoration after voltage restoration
P3	The exposure finished and the tube is in state of cooling, pausing the functions	The LED display code P3	Prohibit exposure	Waiting for automatic restoration after pre-set time (1/60)
P4	The exposure process ended earlier than adjusted	The LED display code P4	Prohibit exposure	Waiting for automatic restoration
P5	Line released between controller and Tubehead or Tubehead broken	The LED display code P5	Prohibit exposure	Contact a specialized professional or XZeal to solutions

Warning

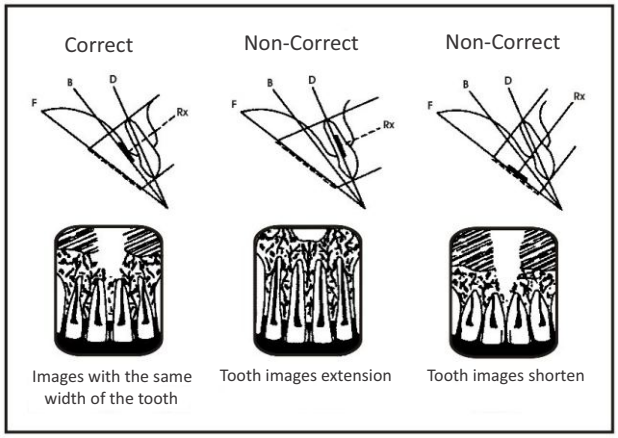
Normally the P1 and P2 failure means the using power voltage is not stable .We suggest the installation of a 1.5KW automatic AC Voltage Regulators.

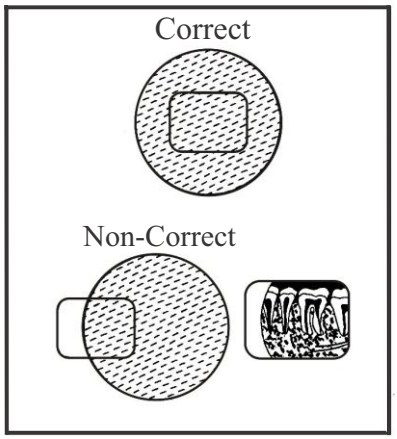
8. Radiograph Teeth Table Angle

Above tooths		Under tooths	
Teeth position	Radiograph Angle	Teeth position	Radiograph Angle
1, 2	+42°	1,2	-15°
3	+45°	3	-18 to -20°
4,5,6	+30°	4,5,6	-10°
7,8	+20°	7,8	-5°

9. Possible Failures in Dental Radiograph

Typical defects of intra-oral radiology	Possible causes:
Light radiographs / grainy image with the Digital Sensor	Insufficient exposure to X-ray (short time) Insufficient development time Deteriorated developer Developer temperature below recommended value Incorrect developing fluid dilution
Dark radiographs:	Excessive exposure to X-ray (long time) Excessive development time Developer temperature above recommended value Incorrect developing fluid dilution
Blurred radiographs (details not visible):	The patient moved The tubehead moved
Partially exposed radiographs:	X-ray directed off the film's mid section Low developmental fluid level, with consequent partial film development Two or more films placed against each other during development
Clouded radiographs:	Excessive film shelf life (check expiration date) Film accidentally exposed to X-ray Film accidentally exposed to other natural or artificial light sources
Radiograph showing a black line:	This line appears when the film is excessively folded
Radiographs showing signs of electrostatic charge:	When film is compressed too much and the air is dry, static electricity may be released discharging in the compensation points, which display black marks.
Film with chemical spots:	Development and fixing fluid spattered on the film before development and fixing procedures produces spot on the radiograph; such spots are: Dark, when caused by development fluid Light when caused by fixing fluid
Film with emulsion coming off:	If the film is kept in a hot water bath too long (e.g. throughout the whole night), the emulsion may become softer and partially come off the film base. After development, the film will show scratches.
Typical defects caused by incorrect positioning	
Radiographs with elongated or shortened image:	The main beam is not perpendicular to the bisecting of the angle formed by the tooth longitudinal axis and the film.
Film with stretched out tip tooth	Probably caused by excessive film folding inside patient's mouth.





10. Measurements (Informative only)

All measurements should be done with the equipment supplied at nominal line voltage according specified at the 2.1. item. The tolerances on the measured values must be considered the precision of the each measurement instrument.
Only specialized technicians must make the measures.

Warning
Measurements have to be done by trained personnel only to avoid risk of electrical shock.

10.1 Line Voltage

The line voltage can be measured using a voltmeter for alternate current within the proper range.

10.2 Anode Voltage (kVp)

The kVp level is the actual peak value of the anode voltage which stabilizes once the pre-heating time of the filament has elapsed (in about 200 ms) and the high voltage transformer is actually loaded. The kVp level can be measured with a non-invasive kVp meter placed in front of the Beam Limiting Device following the instructions in the User Manual of the instrument. A correct measure can be done with an exposure time of 500 ms or more having introduced a delay of the reading instrument of about 300 ms to allow the voltage level to stabilize after the pre-heating time has elapsed.

10.3 Anode Current (mA)

Warning

To prevent high voltage shock make sure the system is disconnected from power supply when the connections to the measurement points are performed.
Electric discharge might occur in case of improper operation.
The anode current in mA is the actual average value of the tube current which raises when the filament has warmed-up, after the pre-heating time has elapsed.
Remove the Tubehead cover to access the two points of measure.
The anode current can be read with DC voltmeter connected in each point with the 1V corresponding to 1mA (use 1000 Ohm precision resistor for the measure).

10.4 Exposure Time

The Exposure Time can be measured with a non-invasive timer meter placed in front of the Beam Limiting Device following the instructions in the User Manual of the instrument.
In order to assure the requested exposure time (irradiation), the pre-heating time of the insert used, which has been set-up at installation, is taken into consideration.
The actual switch-on time of the Tubehead assembly is therefore the sum of the filament pre-heating time and of the requested exposure time.

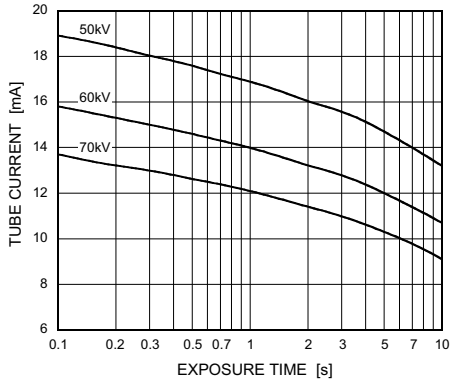
11. X-Ray Tube Chart

TOSHIBA - Model D-0712

Maximum Rating Charts
(Absolute maximum rating charts)

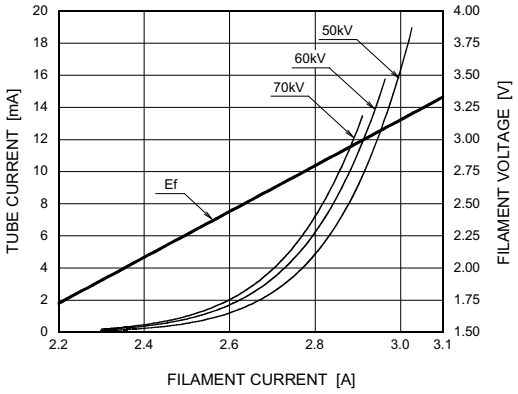
One-Peak High-Voltage Generator

Nominal Focal Spot Value: 0.7



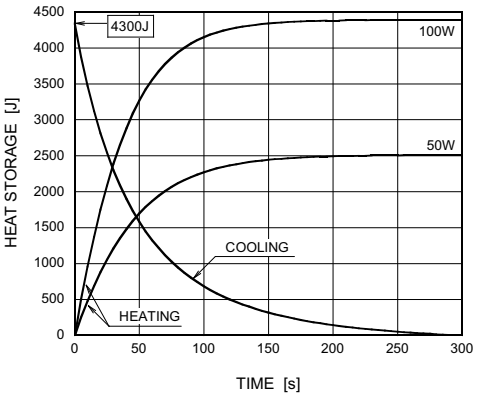
Emission & Filament Characteristics

One-Peak High-Voltage Generator



Note: This graph indicates typical characteristics.

Anode Heating / Cooling Curve



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