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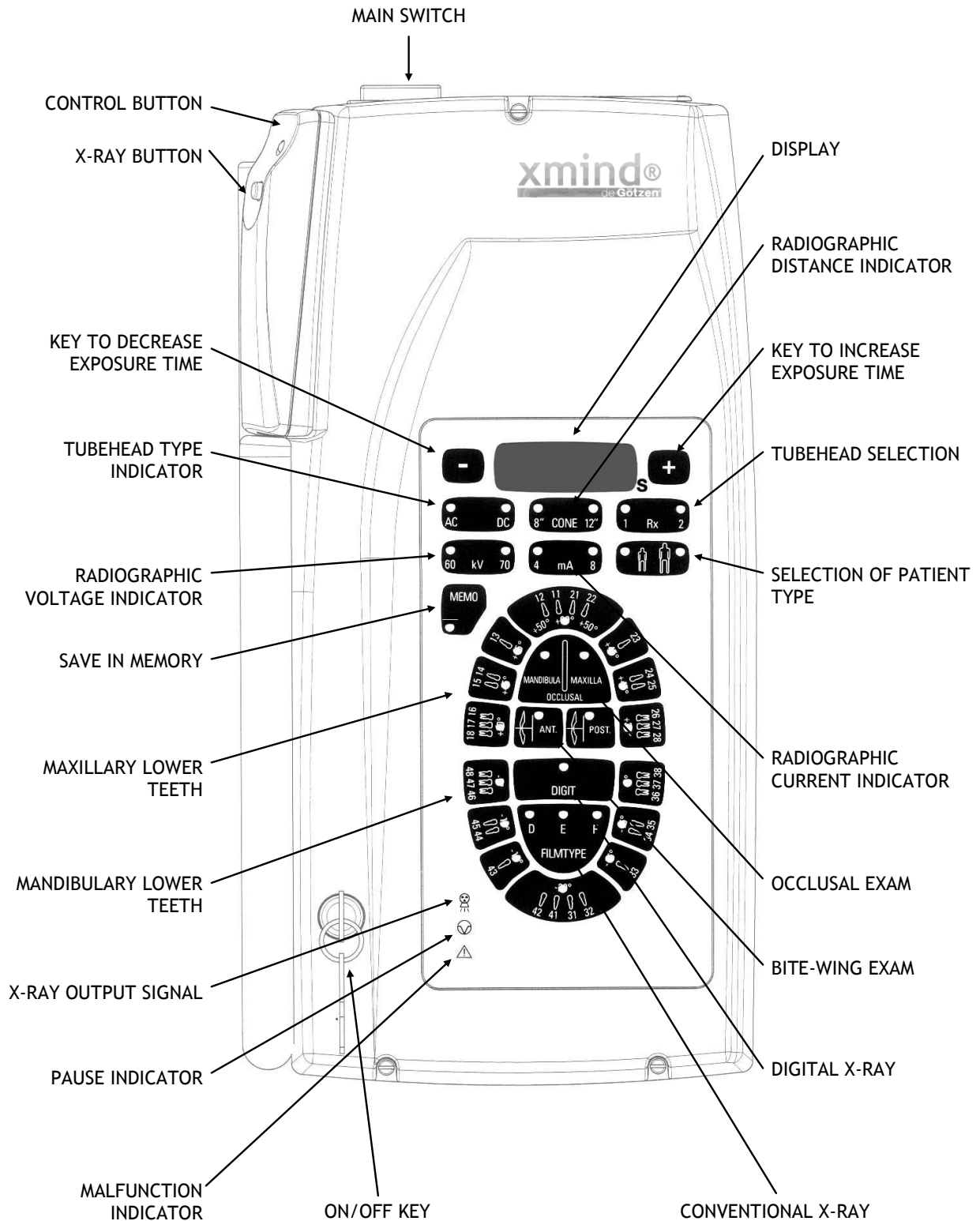


xmind®

intraoral x-ray system

USER'S MANUAL

Control panel



THE RADIOGRAPHIC SYSTEM DESCRIBED IN THIS MANUAL REFERS TO A WALL INSTALLATION.

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ORIGINAL LANGUAGE: ITALIAN

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Summary

Control panel.....	3
CHAPTER 1.....	4
PRELIMINARY INFORMATION.....	4
INFORMATION FOR THE USER	4
WARRANTY CONDITIONS	5
TRANSPORT CONDITIONS	5
SAFETY WARNINGS	6
CHAPTER 2.....	8
RADIOGRAPHIC SYSTEM	8
SYSTEM COMPONENTS	9
IDENTIFICATION TAGS	11
CHAPTER 3.....	12
CONFIGURATION	12
CHAPTER 4.....	14
INSTRUCTIONS FOR USE.....	14
CHAPTER 5.....	21
CHART OF DEFAULT EXPOSURE VALUES.....	21
CHAPTER 6.....	24
PROGRAMMING DEFAULT EXPOSURE VALUES.....	24
RESTORING ORIGINAL VALUES	26
CHAPTER 7.....	27
DIAGNOSIS	27
CHAPTER 8.....	28
ERROR MESSAGES	28
CHAPTER 9.....	29
SYSTEM TECHNICAL DATA	29
CHAPTER 10	32
RECOMMENDED MAINTENANCE.....	32
CLEANING THE OUTER SURFACE.....	32
CHAPTER 11	33
REPAIRS	33
DISPOSAL	33
CHAPTER 12	34
ATTACHMENTS.....	34

CHAPTER 1

PRELIMINARY INFORMATION

PRELIMINARY INFORMATION

Before you start to use the “**xmind**®” radiographic system, it is recommended to carefully read and follow the instructions contained herein, in order to obtain the best possible performance.

Always pay close attention to the

CAUTION
WARNING
PLEASE NOTE

messages when operating the system.

KEY



CAUTION

The word **CAUTION** identifies those occurrences which might jeopardize the operator’s personal safety or cause physical injuries.



WARNING

The word **WARNING** identifies those occurrences which might compromise the radiographic system’s performance.



PLEASE NOTE

PLEASE NOTE gives special indications to facilitate maintenance or to make important information clearer.

INFORMATION FOR THE USER

Dear Customer,

Thanks for having chosen the “**xmind**®” radiographic system.

It is designed and manufactured by “de Götzen® S.r.l.” and is the result of many years of experience in the field of radiology and in the application of advanced electronics.

This high performance system represents a further development of technological research at the service of dental radiography.



PLEASE NOTE

This manual does not contain all the recommendations and the obligations relative to the possession of a source of ionising radiations - since they can vary from state to state - but only the most common ones.

The user must consult his/her country’s legislation so as to fulfil all local obligations.

WARRANTY CONDITIONS

Inappropriate use or any arbitrary tampering will nullify the liability of “de Götzen® S.r.l.”, as manufacturer of the “**xmind®**” radiographic system, for the provision of any service or other responsibility under the terms of the warranty.

The warranty is valid only if the following precautions are taken:

- Any repairs, modifications, adjustments, re-calibrations must be performed only by “de Götzen® S.r.l.”
- The installation must be made by professionally-qualified technicians according to the regulations in force
- The system must be installed and used in compliance with the instructions given in this Manual and for the purposes and applications for which it was designed
- The power supply must be adequate to supply the required power indicated in the radiographic system’s nameplate data
- In order to safeguard one’s warranty rights, please fill in the enclosed Warranty Document, immediately after the installation is completed, with the technician’s help.

TRANSPORT CONDITIONS

The “**xmind®**” radiographic system travels at the receiver’s own risk.

All claims for damage or loss regarding the shipment must be identified in the presence of the shipping agent.

In the case of loss, or actual or suspected damage, the receiver should indicate the proper reserves on the way-bill or on the consignment note.

SAFETY WARNINGS

The safety recommendations listed below should be followed when using the “**xmind®**” radiographic system.



CAUTION

PROTECTION AGAINST RADIATION

“The general principles regarding safety and protection of workers and people” must always be applied when using the unit:

1. Justification of the examination
2. Protection Optimisation (ALARA)
3. Reduction of the limits of individual dose and risks.

The radiographic system must only be used by authorized and qualified personnel.

All personnel present during the radiographic examination must comply with safety measures foreseen with regard to protection from radiation.

For the operator’s safety, a distance of more than 2 meters from the radiographic unit must always be respected.

To protect the patient from unnecessary exposure to radiation, additional anti-radiation protections may be used whenever necessary (aprons, collars, etc.).



CAUTION X-RAYS



CAUTION

MECHANICAL RISK

Before removing the tubehead from the positioning arm, **RELEASE THE SPRING** because the joint might burst open and hit the operator.



CAUTION

ELECTRIC SAFETY

The radiographic system contains high voltage.

When inspecting internal parts, always turn off the power before touching any electric part.

The unit must be used only in environments that are in full compliance with all electric safety standards for medical environments.

The unit is **NOT** equipped with protections against the penetration of liquids; it will therefore be necessary to make sure that no water or other liquids penetrate inside so as to avoid short circuits or corrosion.

Always disconnect the radiographic system from the power supply before cleaning and disinfecting operations.

**CAUTION****PROTECTION AGAINST EXPLOSIONS**

The radiographic system **MUST NOT** be used in the presence of disinfectants, flammable or potentially explosive gases or vapours that might catch fire and cause damage.

In the case that these disinfectants have to be used, let the vapour completely evaporate before turning on the radiographic system.

RADIOGRAPHIC SYSTEM

The “xmind®” radiographic system guarantees maximum safety both for the operator and the patient.

It is built in compliance with the following European Directives:

- 93/42/EEC
MEDICAL DEVICES
- 73/23/EEC
LOW VOLTAGE
- 89/336/EEC
ELECTROMAGNETIC COMPATIBILITY
- EURATOM 96/29
IONISING RADIATIONS

and the following American Standard:

- American Radiation Performance Standard 21 CFR, Subchapter J.

The following protective measures were adopted in the design and construction of the unit:

- Protection against the risk of electric injuries, ensured by a grounded protection conductor
- Protection against leakage radiation, made negligible by the shielded casing
- Protection against excessive radiation, thanks to the immediate activation of the safety device
- Protection against continuous service, since the system is designed, according to standards, so as not to allow use in radioscopy
- Protection for the operator against irradiation ensured by the extensible cable of the hand control which allows for a safety distance of more than 2 meters
- Protection against involuntarily selection of radiographic technique (FILM or DIGIT) obtained, according to standards, by means of the confirming of the key of selection.

“ELECTRO-MEDICAL” CLASSIFICATION

According to paragraph 5 of the general safety regulations EC EN 60 601-1/1998 on safety of medical equipment, the system is classified as: **Class I - Type B.**

“MEDICAL DEVICES” CLASSIFICATION

According to the classification rules indicated in attachment IX of the EEC Directive 93/42 on medical devices the system is classified as: **Class IIb.**

“E.M.C.” CLASSIFICATION

According to paragraph 4 of the EEC EN 55011, the system is classified as: **Group 1 - Class B.**

SYSTEM COMPONENTS

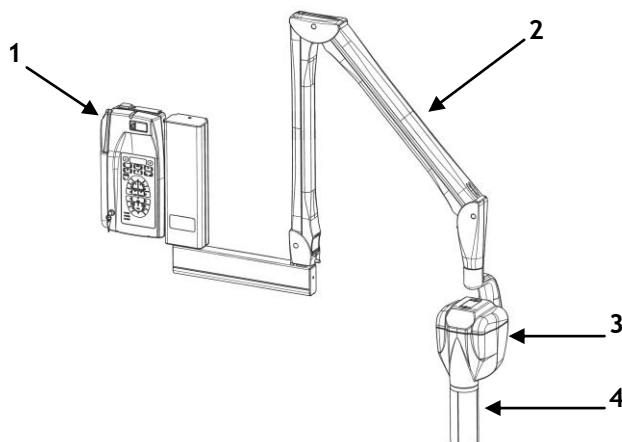


Figure 1

xmind[®] radiographic system (Figure 1) consists of:

1. xmind[®] TIMER

The timer is the control panel used to manage the times and to safely use the tubehead.

To take the exposure the control button is equipped with a safety button.

The timer can be connected to two tubeheads.

The timer is a “multi-technological” type and it is able to control tubeheads of different technologies: alternating current “xmind[®] ac” and direct current “xmind[®] dc”.

In the case of alternating current tubeheads the timer technology is “self-compensating”.

Depending on the line voltage fluctuation the microprocessor automatically modifies the predetermined exposure time guaranteeing a constant dose to the patient.

This technological feature avoids the repetition of exposures due to over/under exposure errors.

2. PANTOGRAPH

Thanks to the new shape and new mechanisms of the positioning arm, it can be adjusted in height and depth so as to precisely explore any spot in its reach.

It is made of light alloy with an ABS coating.

CHAPTER 2

SYSTEM COMPONENTS

3. xmind® TUBEHEAD

The “xmind®ac” intra-oral tubehead is a monoblock type and is made in a light alloy housing.

The high voltage transformer, the x-ray tube and the expansion chamber are submerged in highly dielectric oil.

The expansion chamber guarantees an adequate compensation to oil expansion for the entire temperature range.

The x-ray tube is located in the back part of the container, allowing a source-skin distance 50% higher than traditional structures.

4. CONE

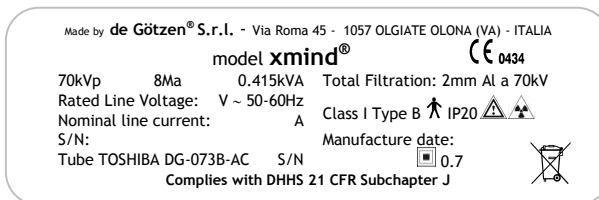
Made of the transparent polycarbonate, it allows for:

- Correct focal spot to skin distance
- Dimension, direction and centering of x-ray beam
- Realization of different radiographic technique (bisecting and parallel technique).

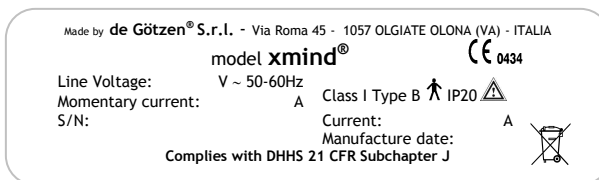
IDENTIFICATION TAGS

The identification tags on the tubehead, on the timer and on the cone indicate the model number, the serial number, the manufacturing date and the symbols of the main technical characteristics.

TUBEHEAD



TIMER



CONE



GRADUATED SCALE



PICTOGRAMS USED



THIS SYMBOL GUARANTEES THAT THE RADIOGRAPHIC SYSTEM COMPLIES WITH THE REGULATIONS CONTAINED IN THE EUROPEAN DIRECTIVE EEC 93/42 RELEVANT TO MEDICAL DEVICES



THE DEGREE OF PROTECTION AGAINST DIRECT AND INDIRECT ELECTRIC CONTACTS IS B TYPE



REFER TO INSTRUCTIONS MANUAL



SYMBOL INDICATING DANGER DUE TO IONISING RADIATIONS



SIZE OF THE FOCAL SPOT





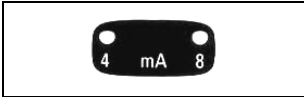




WEEE (Waste Electrical and Electronic Equipment) SYMBOL, IN CONFORMITY WITH 2002/96/CE DIRECTIVE AND EN 50419 STANDARD.

CONFIGURATION

The “xmind®” radiographic system is factory configured in “standard mode”.

On the control panel the LED relevant to the following exposure parameters will light up:

 A rectangular control panel with two circular LEDs. The left LED is labeled '1' and the right LED is labeled '2'. The text 'Rx' is centered between the two LEDs.	No. of the selected tubehead LED 1
 A rectangular control panel with two circular LEDs. The left LED is labeled '8"' and the right LED is labeled '12"'. The text 'CONE' is centered between the two LEDs.	Supplied cone LED 8" = SHORT CONE LED 12" = LONG CONE
 A rectangular control panel with two circular LEDs. The left LED is labeled 'AC' and the right LED is labeled 'DC'.	Tubehead type LED AC = ALTERNATING CURRENT
 A rectangular control panel with two circular LEDs. The left LED is labeled '60' and the right LED is labeled '70'. The text 'kV' is centered between the two LEDs.	Radiographic voltage LED 70 kV
 A rectangular control panel with two circular LEDs. The left LED is labeled '4' and the right LED is labeled '8'. The text 'mA' is centered between the two LEDs.	Radiographic current LED 8 mA
 A rectangular control panel with two circular LEDs. Between the LEDs are two stylized human figures representing an adult.	Type of patient LED ADULT
 A semi-circular control panel with three circular LEDs. The left LED is labeled 'D', the middle LED is labeled 'E', and the right LED is labeled 'F'. Below the LEDs is the text 'FILMTYPE'.	Radiographic technique CONVENTIONAL LED D

The following exposure times (sec) have been stored:

0.080 - 0.100 - 0.125 - 0.160 - 0.200 - 0.250 - 0.320 - 0.400 - 0.500 - 0.630 - 0.800 - 1.00 -
1.250 - 1.600 - 2.000 - 2.500 - 3.200



PLEASE NOTE

These times are in compliance with current CEI EN 60601-2-7 (1999) norms and with the ISO 497 series R'10 recommendations.

MAY NOT BE MODIFIED

Certain exposure values have been predefined which depend on the selection of the operating parameters:

- Cone (8"/12")
- Type of patient (ADULT/CHILD)
- Radiographic technique
- Intra-oral test.



PLEASE NOTE

If one so desires, it is possible to change this values.

POSSIBLE MODIFICATIONS OF THE EXPOSURE VALUES

- Type of patient (ADULT/CHILD)
- Radiographic technique



(refer to Chapter 4).

POSSIBLE MODIFICATIONS OF THE EXPOSURE VALUES

- Tubehead no.
- Control button no.
- Cone (8"/12")

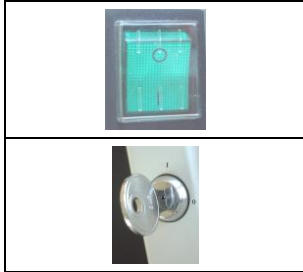


inside the timer, by changing the dip-switch position.

THIS OPERATION MUST BE CARRIED OUT BY THE INSTALLER ONLY.

INSTRUCTIONS FOR USE

TURN ON - 1°



Put the main switch located on the upper part of the timer to the “I” position (ON).


Turn the key switch to the “I” position (ON).

1. The green light turns on indicating that the system is powered.
2. The LEDs of the set parameters automatically light up.
3. The exposure time is shown on the display.



CAUTION

If an error is detected when the system is turned on, the anomaly is indicated as follows:

- An intermittent beep sounds
- The  LED MALFUNCTION INDICATOR flashes
- The error code (E) appears on the display (*refer to Chapter 8*)
- All control panel functions are inhibited.

In this case turn off the timer and then turn it back on.

If the error should repeat itself, call the “After Sales Service”.



PLEASE NOTE

The exposure time and parameters which appear on the display are the last that were set before the timer was turned off.

If the timer remains inactive for a few minutes, it switches to stand-by mode. Press any key on the control panel to restore it to the operative mode.

CHECK THE SELECTED PARAMETERS - 2°

Before making the exposure check that the parameters selected on the control panel (from Step 1 to Step 8) are suitable for the radiographic examination.

STEP 1 CHECK THE SELECTED TUBEHEAD

The LED of the chosen tubehead should be turned on.



LED **Rx 1 ON** indicates that the tubehead connected to the timer XRAY1 terminal block is selected.

LED **Rx 2 ON** indicates that the tubehead connected to the timer XRAY2 terminal block is selected.

To change the selection press the button again.

STEP 2 CHECK THE SELECTED RADIOGRAPHIC DISTANCE CONE

The LED of the cone length (source-skin distance = SSD) in use should be turned on.



LED **8" ON** indicates that the selected tubehead is equipped with 8" = 20 cm (SSD) cone.

LED **12" ON** indicates that the selected tubehead is equipped with 12" = 31 cm (SSD) cone.

To change the selection call the "After Sales Service".

**PLEASE NOTE**

After modification, default exposure values will be changed automatically.

STEP 3 CHECK THE SELECTED TYPE TUBEHEAD

The LED of the type of tubehead should be turned on.



LED **AC ON** indicates that the selected tubehead works in alternating current technology.

STEP 4 CHECK THE SELECTED RADIOGRAPHIC VOLTAGE

The LED of the radiographic voltage should be turned on.



LED **70 kV ON**.

If LED is not lit call the "After Sales Service".

CHAPTER 4

INSTRUCTIONS FOR USE

STEP 5 CHECK THE SELECTED RADIOGRAPHIC CURRENT

The LED of the radiographic current should be turned on.



LED 8 mA ON.

If LED is not lit call the “After Sales Service”.

STEP 6 CHECK THE SELECTED TYPE OF PATIENT

The LED of the desired patient type should be turned on.



LED CHILD ON indicates that the radiographic system is set for a patient with a small physique.

LED ADULT ON indicates that the radiographic system is set for a patient with a large physique.

To change the selection press the button again.



PLEASE NOTE

After modification, default exposure values will be changed automatically.

STEP 7 CHECK THE SELECTED RADIOGRAPHIC TECHNIQUE

CONVENTIONAL TECHNIQUE (FILM)

The LED of the chosen film speed should be turned on.



LED D ON: the radiographic system is set for use with D speed film.

LED E ON: the radiographic system is set for use with E speed film.

LED F ON: the radiographic system is set for use with F speed film.

To change the selection press the button again for 3 sec until the signal beeps.

**PLEASE NOTE**

The F speed is NOT available with the use of the 8" cone (SSD = 20 cm) in the "xmind®" radiographic system.

**PLEASE NOTE**

After modification, default exposure values will be changed automatically.

DIGITAL TECHNIQUE (SENSOR)

The LED should be turned on.



To change the selection press the button again for 3 sec until the signal beeps.

**PLEASE NOTE**

After modification, default exposure values will be changed automatically.

CHAPTER 4

INSTRUCTIONS FOR USE

STEP 8 CHECK THE SELECTED RADIOGRAPHIC TECHNIQUE

PERIAPICAL EXAM

The LED of the selected teeth should be turned on.



To change the selection press the key relevant to the tooth chosen.

OCCLUSAL EXAM

The LED of the selected type of test should be turned on.



LED MANDIBULA ON: the radiographic system is set for occlusal exam of the lower jaw.

LED MAXILLA ON: the radiographic system is set for occlusal exam of the upper jaw.

To change the selection press the button again.

BITE-WING EXAM

The LED of the selected type of test should be turned on.



LED ANT ON: the radiographic system is set for anterior bite-wing exam.

LED MAXILLA ON: the radiographic system is set for posterior bite-wing exam.

To change the selection press the key relevant to the examination chosen.

POSITIONING THE PATIENT - 3°

Position the patient according to standard intra-oral procedures.

POSITIONING THE FILM OR SENSOR - 4°

Position either the film or the digital sensor depending on the technique to be used.

POSITIONING THE CONE - 5°

Position the cone according to standard intra-oral procedures.

CHECK THE SELECTED TIME ON THE DISPLAY - 6°

Before proceeding with the exposure, check the selected time on the display.



To change the selection press the following keys.

**WARNING**

This modification of the exposure time is momentary and will be lost unless it is saved.



(refer to Chapter 6).

To restore the previous values, press one of the keys with the LED turned off on the control panel.

CHAPTER 4

INSTRUCTIONS FOR USE


TO MAKE THE EXPOSURE - 7°

1. Take the control button of the timer relevant to the selected tubehead and keep a safety distance (of a least 2 meters) from the tubehead, so as to be able to constantly check the radiographic exposure.
2. Advise the patient to remain still.
3. On the control button press the  X-RAY key and keep it pressed until the acoustic signal (beep) stops and the yellow LED turns off .



PLEASE NOTE

If the "X-RAY" key is released early, the exposure is immediately interrupted and the E12 error message appears on the display.

4. At the end of the exposure the green LED flashes  PAUSE.
5. The display indicates the actual exposure time.
6. All the timer functions are inhibited.



PLEASE NOTE

The pause time is necessary to allow the x-ray tube to cool down.

This time is calculated by the microprocessor, depending on the exposure time, with a ratio of 1:32 (32 second of pause are required for each second of exposure).

A NEW EXPOSURE WILL BE POSSIBLE AFTER THE GREEN LED  HAS TURNED OFF

REPEAT THE OPERATIVE SEQUENCE FROM POINT 2 TO POINT 7

CHART OF DEFAULT EXPOSURE VALUES

The chart indicates the “**xmind**®” radiographic system’s predefined exposure values.

I	INCISOR
C	CANINE
P	PREMOLAR
M	MOLAR
Ba	ANTERIOR BITE-WING
Bp	POSTERIOR BITE-WING
Oa	OCCLUSAL ANTERIOR
Op	OCCLUSAL POSTERIOR



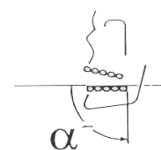
PLEASE NOTE

The default exposure times can be modified.
(refer to Chapter 6).


CHAPTER 5

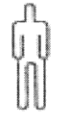
CHART OF DEFAULT EXPOSURE VALUES

12" LONG CONE
(SSD = 31 cm)




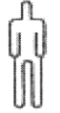
CONVENTIONAL RADIOGRAPHIC TECHNIQUE
(FILM)

		ADULT																
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	2.000		2.500
FILM D	MAXILLA								I	CP Bp	M	Op						
	MANDIBLE							I	CP	M Ba	-	Oa						
FILM E	MAXILLA						I	CP Bp	M	Op								
	MANDIBLE					I	CP	M Ba	-	Oa								
FILM F	MAXILLA					I	CP Bp	M	Op									
	MANDIBLE				I	CP	M Ba	-	Oa									

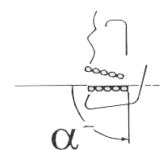
		CHILD																
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	2.000		2.500
FILM D	MAXILLA							I	CP Bp	M	Op							
	MANDIBLE							I	CP	M Ba	-	Oa						
FILM E	MAXILLA					I	CP Bp	M	Op									
	MANDIBLE				I	CP	M Ba	-	Oa									
FILM F	MAXILLA				I	CP Bp	M	Op										
	MANDIBLE			I	CP	M Ba	-	Oa										

DIGITAL RADIOGRAPHIC TECHNIQUE
(SENSOR)

		ADULT																
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	2.000		2.500
MAXILLA				I	CP Bp	M	Op											
MANDIBLE			I	CP	M Ba	-	Oa											

		CHILD																
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	2.000		2.500
MAXILLA			I	CP Bp	M	Op												
MANDIBLE		I	CP	M Ba	-	Oa												

8" SHORT CONE (SSD = 20 cm)



CONVENTIONAL RADIOGRAPHIC TECHNIQUE (FILM)

		ADULT														
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	
FILM D	MAXILLA					I	CP Bp	M	Op							
	MANDIBLE				I	CP	M Ba	-	Oa							
FILM E	MAXILLA			I	CP Bp	M	Op									
	MANDIBLE		I	CP	M Ba	-	Oa									
FILM F	MAXILLA	NOT AVAILABLE														
	MANDIBLE	NOT AVAILABLE														

		CHILD														
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	
FILM D	MAXILLA				I	CP Bp	M	Op								
	MANDIBLE			I	CP	M Ba	-	Oa								
FILM E	MAXILLA		I	CP Bp	M	Op										
	MANDIBLE	I	CP	M Ba	-	Oa										
FILM F	MAXILLA	NOT AVAILABLE														
	MANDIBLE	NOT AVAILABLE														

DIGITAL RADIOGRAPHIC TECHNIQUE (SENSOR)

		ADULT														
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	
MAXILLA				I	CP Bp	M	Op									
MANDIBLE			I	CP	M Ba	-	Oa									

		CHILD														
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	
MAXILLA			I	CP Bp	M	Op										
MANDIBLE		I	CP	M Ba	-	Oa										

PROGRAMMING DEFAULT EXPOSURE VALUES



WARNING

The 17 programmed exposure times may not be modified in the “xmind®” radiographic system.

Meanwhile you can customize the default exposure values.



WARNING

After customization, the “Chart of default exposure values” (*refer to Chapter 5*) are no longer valid any more.

For programming the new exposure values press the following keys.



PLEASE NOTE

When the key is kept pressed the “repeat” function is automatically activated so the time shown on the display scrolls faster.

To confirm the new program check the LED of the key is lit up.



LED **MEMO ON** indicates that it is possible to save the new default exposure value. Press the button for 3 sec until the acoustic signal beeps to save the new default exposure values.

LED **MEMO OFF** indicates that it is not possible to save the new default exposure value.



PLEASE NOTE

It is not possible to save data when the “range of exposure field” exceeds the programmed exposure time limits.

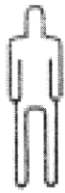
(refer to example to the next page).

EXAMPLE

**12" LONG CONE
(SSD = 31 cm)**

CONVENTIONAL RADIOGRAPHIC TECHNIQUE
(FILM)

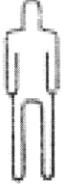
PREDEFINED DEFAULT EXPOSURE VALUES

		ADULT																
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	2.000		2.500
FILM D	MAXILLA								I	CP Bp	M	Op						
	MANDIBLE							I	CP	M Ba	-	Oa						
FILM E	MAXILLA						I	CP Bp	M	Op								
	MANDIBLE					I	CP	M Ba	-	Oa								
FILM F	MAXILLA					I	CP Bp	M	Op									
	MANDIBLE				I	CP	M Ba	-	Oa									

CUSTOMIZED EXPOSURE VALUES

	I	CP Bp	M	Op
I	CP	M Ba	-	Oa

THE RANGE OF EXPOSURE FIELD HAS BEEN REDUCED BY TWO STEPS.

		ADULT																
PROGRAMMED EXPOSURE TIMES (sec)		0.080	0.100	0.125	0.160	0.200	0.250	0.320	0.400	0.500	0.630	0.800	1.000	1.250	1.600	2.000		2.500
FILM D	MAXILLA						I	CP Bp	M	Op								
	MANDIBLE					I	CP	M Ba	-	Oa								
FILM E	MAXILLA				I	CP Bp	M	Op										
	MANDIBLE			I	CP	M Ba	-	Oa										
FILM F	MAXILLA			I	CP Bp	M	Op											
	MANDIBLE		I	CP	M Ba	-	Oa											

CHAPTER 6

RESTORING ORIGINAL VALUES

RESTORING ORIGINAL VALUES



OFF



ON

1. Turn the timer off.
2. Keep the key pressed turn the timer on.
3. On the display appears.
4. Release the key.
5. Press again the key.
6. Appears on the display.
7. Turn the timer on and off.

★ ★ ★






DIAGNOSIS

With the “**xmind**®” radiographic system it is possible to set and visualise certain functional parameters.

To set the parameters, the installer must:

To visualise them proceed as follows:

1. Press simultaneously and keep pressed the keys
 (17) MAXILLA MOLAR
 (47) MANDIBULARY MOLAR
2. Press the key associated to the parameter one wishes to:

KEY	DISPLAY PARAMETER
	RADIOGRAPHIC SYSTEM NOMINAL VOLTAGE
	LINE VOLTAGE
	MAXIMUM LINE VOLTAGE VALUE DETECTED
	MINIMUM LINE VOLTAGE VALUE DETECTED
	SOFTWARE VERSION

CHAPTER 8

ERROR MESSAGES

ERROR MESSAGES

The following chart gives a list of error messages that may appear while the “xmind®” radiographic system is working.

The chart also includes the causes of the error messages and what to do to solve them.

ERROR MESSAGES	CAUSE	SOLUTION
E00	RX1 TUBEHEAD IS NOT CONNECTED OR IS OUT OF ORDER	CALL THE “AFTER SALES SERVICE”
E01	RX2 TUBEHEAD IS NOT CONNECTED OR IS OUT OF ORDER	CALL THE “AFTER SALES SERVICE”
E02	CORRUPTED EEPROM DATA	CALL THE “AFTER SALES SERVICE”
E03	EEPROM DATA NOT SAVED PROPERLY	CALL THE “AFTER SALES SERVICE”
E05	LINE VOLTAGE VALUE NOT INCLUDED WITHIN THE SET LIMITS	CALL THE “AFTER SALES SERVICE”
E07	LINE VOLTAGE VALUE NOT INCLUDED WITHIN THE $\pm 15\%$ NOMINAL VALUE	CALL THE “AFTER SALES SERVICE”
E08	THE X-RAY KEY ALWAYS SEEMS TO BE PRESSED	MAKE SURE IT IS NOT JAMMED
E09	ANOMALY IN THE CONTROL PANEL	CALL THE “AFTER SALES SERVICE”
E12	THE EXPOSURE HAS BEEN PREMATURELY INTERRUPTED	KEEP THE X-RAY KEY PRESSED TILL THE END OF THE EXPOSURE
E20	ANOMALY IN THE TRIAC/RELAY	CALL THE “AFTER SALES SERVICE”
E21	ANOMALY IN THE ELECTRONIC CIRCUIT	CALL THE “AFTER SALES SERVICE”
E22	ANOMALY IN THE CONTROL CIRCUIT	CALL THE “AFTER SALES SERVICE”
E23	INCORRECT DIP-SWITCH CONFIGURATION	CALL THE “AFTER SALES SERVICE”
E24	THE CONTROL BUTTON DOES NOT CORRESPOND TO THE SELECTED TUBEHEAD	CALL THE “AFTER SALES SERVICE”
ERR	MAJOR ERROR	ALL FUNCTIONS ARE DISABLED CALL THE “AFTER SALES SERVICE”

SYSTEM TECHNICAL DATA

POWER SUPPLY CHARACTERISTICS

TYPE OF POWER SUPPLY	Single phase alternate	
NOMINAL VOLTAGE	220 V - 230 V - 240 V	115 V
MAXIMUM VOLTAGE VARIATION	-5% +10%	-5% +10%
NOMINAL CURRENT	3.5 A - 3.2 A - 3 A	5.5 A
FREQUENCY	50/60 Hz	50/60 Hz
ABSORBED POWER	0.8 kVA	0.8 kVA
APPARENT LINE RESISTANCE	0.5 Ω	0.2 Ω
PROTECTION FUSES (F1-F2-F3-F4)	6.3AF - 250V	8AF - 250V
CIRCUIT PROTECTION FUSES	(F5) - no. 1 630 mA - 125 V (F6) - no. 1 500 mA - 125 V	

TECHNICAL DATA OF THE RADIOGRAPHIC SYSTEM

NOMINAL HIGH VOLTAGE	70 kV
NOMINAL CURRENT	8 mA
NOMINAL ELECTRIC POWER AT 0.1 sec	560 W (70 kV - 8 mA)
REFERENCE CURRENT-TIME PRODUCT	0.8 mAs - 8 mA - 0.1 sec
LOAD FACTOR COMBINATION	70 kV - 8 mA
INTENSITY OF RADIATION IN THE AIR	38 μ Gy/mAs \pm 20% at 1 meter away from focal spot
TOTAL FILTRATION	2 mm Al at 70 kV
HALF VALUE LAYER (HVL) AT 70 kV	2 mm Al
LEAKAGE RADIATION	< 0.25 mGy/h to 1 meter away from focal spot
LINEARITY	10%
REPRODUCIBILITY	0.05
ELECTRICAL CLASSIFICATION	Class I - Type B - intermittent service

MEASUREMENT CONDITIONS

kVp	Non-invasive measurement with delay time = 0.05 sec
mA	Direct measurement with digital instrument
EXPOSURE TIME (sec)	Non-invasive measurement to nominal voltage

CHAPTER 9

SYSTEM TECHNICAL DATA

ACCURACY OF TECHNICAL DATA

NOMINAL VOLTAGE OF X-RAY TUBE	70 kVp \pm 10% overlooking initial transient
NOMINAL CURRENT OF THE X-RAY TUBE	8 mA \pm 10% overlooking initial transient
SELECTED EXPOSURE TIME	\pm 100%

WEIGHT

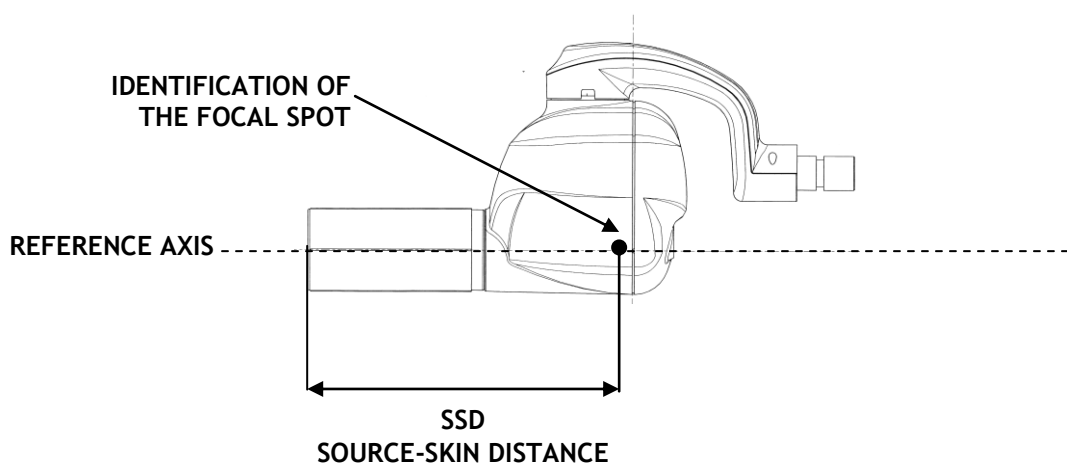
TOTAL WEIGHT	29 kg
WEIGHT OF TUBEHEAD	9 kg

ENVIRONMENTAL CHARACTERISTICS

OPERATIVE TEMPERATURE	+5 °C - +40 °C
WAREHOUSE TEMPERATURE	-15 °C - +50 °C
HUMIDITY	25% - 75%

TECHNICAL DATA OF THE CONE

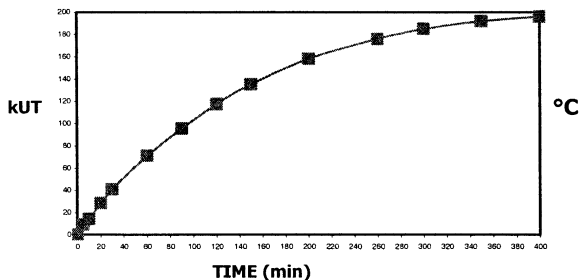
SOURCE-SKIN DISTANCE (SSD)	
SHORT CONE	20 cm (8")
LONG CONE	31 cm (12")
RECTANGULAR CONE	31 cm (12")
DISTANCE OF X-RAY BEAM	
SHORT CONE	\leq 60 mm
LONG CONE	\leq 60 mm
RECTANGULAR CONE	44 x 35 mm



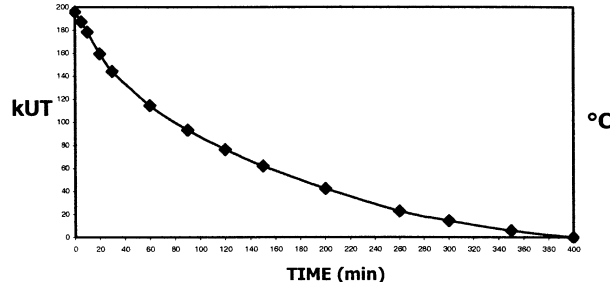
THERMAL CHARACTERISTICS OF THE TUBEHEAD

TUBEHEAD'S HEAT ACCUMULATION CAPACITY	140 kJ (196 kUT)
MAXIMUM COOLING SPEED	1.2 kJ/min (1.8 kUT/min)

HEATING CURVE



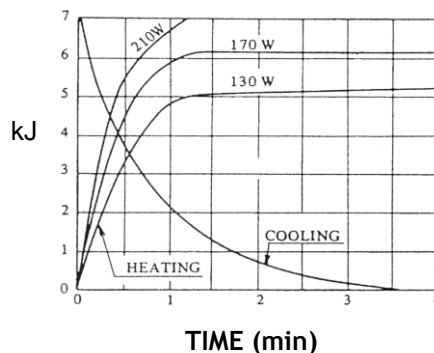
COOLING CURVE



TECHNICAL DATA OF THE X-RAY TUBE

X-RAY TUBE	TOSHIBA DG-073-DC
HIGH VOLTAGE CIRCUIT	Single phase self-rectifying
SIZE OF FOCAL SPOT	0.7 in compliance with IEC 336/1993
NOMINAL ANODE VOLTAGE	70 kV
NOMINAL ANODE CURRENT	8 mA
NOMINAL ANODE POWER	420 W (70 kV - 8 mA from factor = 0.74)
EXPOSURE TIME	0.08 sec ÷ 3.2 sec (17 steps)
NOMINAL HIGH VOLTAGE and MAXIMUM CURRENT	70 kV - 8 mA
TUBE INHERENT FILTRATION	0.8 mm Al at 70 kV
ANODE MATERIAL	Tungsten
ANODE INCLINATION	20°
ANODE HEAD LOAD	7 kJ (10 kUT)
MAXIMUM CONTINUOUS HEAT DISSIPATION	17.5 W
OPERATING CYCLE	1:32

ANODE THERMAL CHARACTERISTICS



RECOMMENDED MAINTENANCE

In order to guarantee safety of the radiographic system, it is necessary to set up a maintenance schedule.

The owner is responsible for organising and observing a maintenance schedule which must be executed by qualified technicians able to certify their work with a “Conformity Declaration”.



CAUTION

Run an inspection on the radiographic system and on its operation when it is installed and every twelve months.

Once a year, lubricate the pins and bushes of the wall plate and the positioning arm, as specified.



WARNING

Do not lose the adjustment key that comes with the system, since, in time, it could become necessary to make readjustments.



WARNING

If the parts should become hard to move or should squeak, call the “After Sales Service”.

CLEANING THE OUTER SURFACE

Use a soft cloth dampened with water and soap to clean the outer surfaces.

The spacer cone may be cleaned with cotton wool soaked with surgical alcohol.

REPAIRS

In case of a malfunction, send the defective part using the original packaging to:

de Götzen® S.r.l.
Via Roma 45
21057 OLGATE OLONA VA ITALY
Tel. +39 0331 376760 r.a.
Fax +39 0331 376763
E-mail: degotzen@degotzen.com

DISPOSAL



The use of the WEEE symbol indicates that this product may not be treated as household waste, but must be treated separately, in conformity to the 2002/96/CE Directive.

By ensuring this product is disposed of correctly, you will help to protect the environment.

For more detailed information about the recycling of this product, please contact your local authority, your house waste disposal service provider or the dealer from whom you purchased the product.



CAUTION

To avoid any risk of environmental contamination, do not dispose of the device and its accessories with household waste materials.

CHAPTER 12

ATTACHMENTS

ATTACHMENTS

The manufacturer undertakes to supply, upon request, drawings, circuit diagrams, component parts lists, instructions or other information needed by qualified technical personnel to perform repairs on those parts of the “xmind®” radiographic system which may be repaired.

