

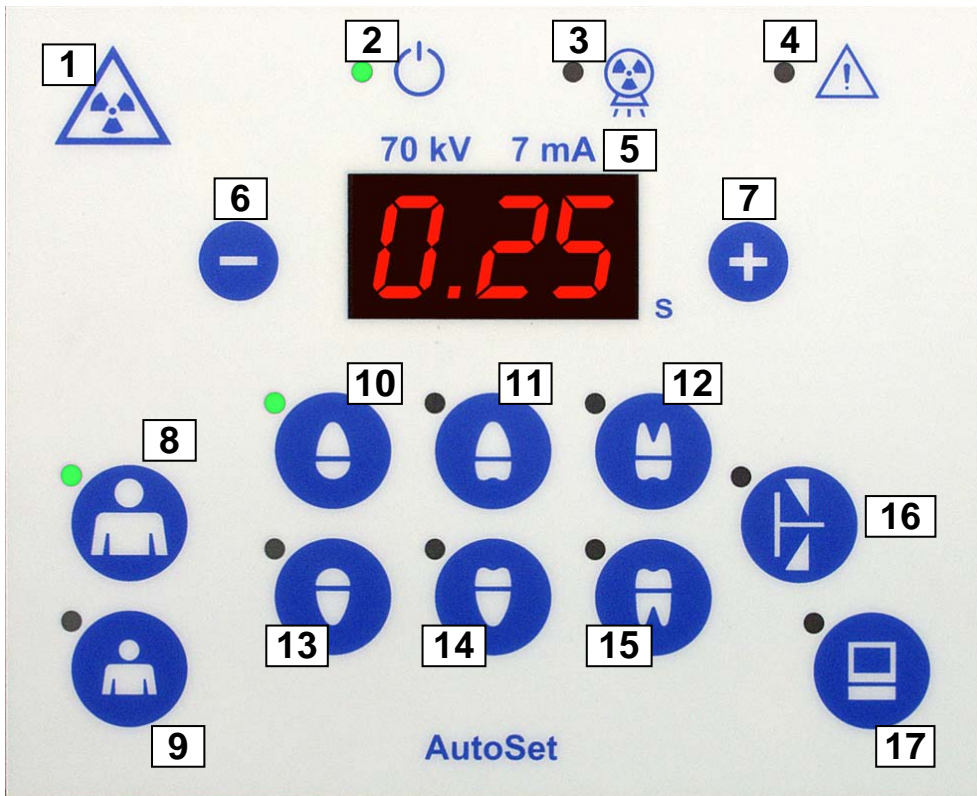
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IntraOs 70 X-Ray Equipment

Service & Installation Manual

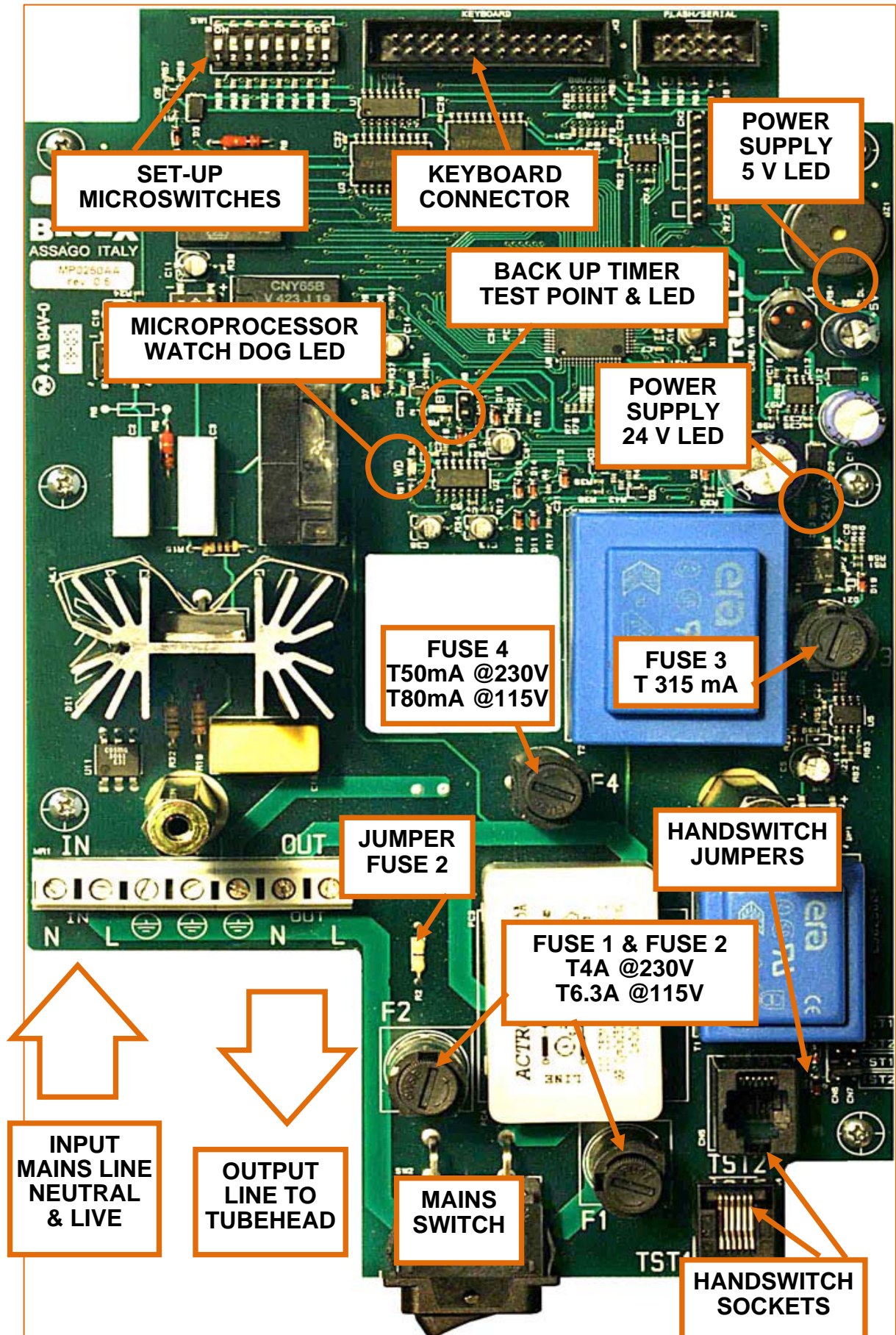


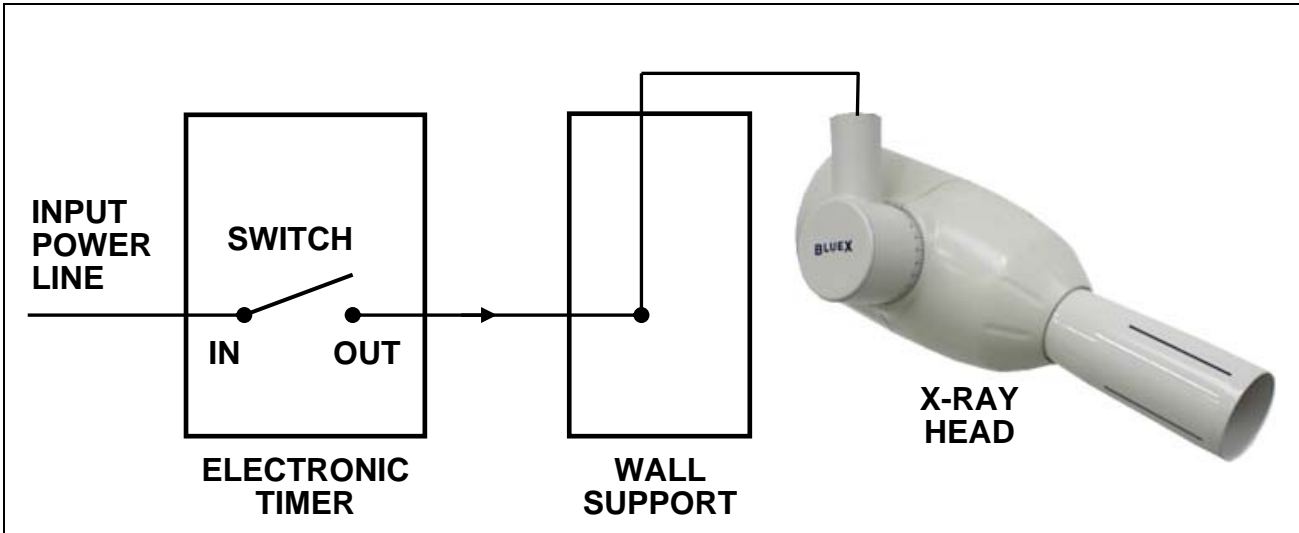
Control panel and exposure pushbutton



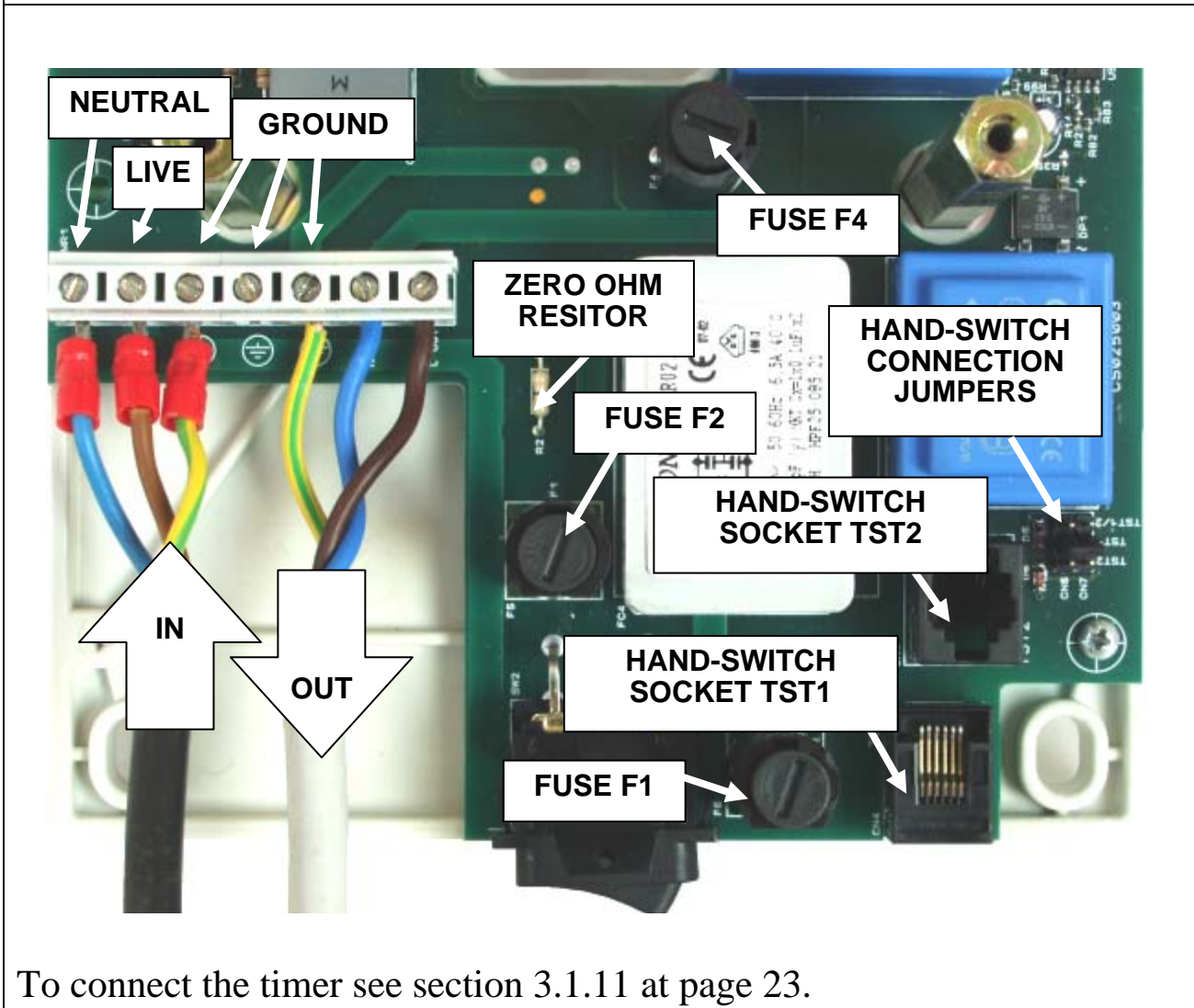
1	Device for emission of ionizing radiation on request
2	Indication of system turned on and ready
3	Irradiation
4	Alarm
5	mAs display, the controlled technique factor
6	Manual decrease of controlled technique factor
7	Manual increase of controlled technique factor
8	Patient size adult/large
9	Patient size child/small
10	Maxillary incisor
11	Maxillary canine or premolar
12	Maxillary molar
13	Mandibular incisor
14	Mandibular canine or premolar
15	Mandibular molar
16	Bite-wing premolar
17	Digital detector
18	Radiation exposure pushbutton

Layout Power Board Timer AutoSet





Electrical requirements: see section 3.1.3 at page 16.



To connect the timer see section 3.1.11 at page 23.



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IntraOs 70 Dental X-ray Equipment
Service & Installation Manual – English Edition

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1. INTRODUCTION

1.1 Purpose

The IntraOs 70 X-ray Equipment is design to fulfill the needs for intra-oral radiography in the general dental practice.

The systems can be configured for wall or mobile solutions.

The available features make the use simple and grant long life with minimum maintenance requirements.

The Operator's Manual and the Service and Installation Manuals supplied with the system are integral part of the product. The original language of the Operator's Manual is English.

1.2 Equipment Classification

- IEC: IntraOs 70 is a Class I, type B equipment
- FDA: IntraOs 60 is a Class II medical device equipment (21 CFR 872-1800).

1.3 Applicable Standards

The IntraOs 70 system configurations, equipped with the AutoSet timer, comply with the following standards.

IEC 601-1	General requirements for safety
IEC 601-1-2	Electromagnetic compatibility
IEC 601-1-3	General requirements for radiation protection in diagnostic X-ray equipment
IEC 601-2-7	Particular requirements for the safety of high voltage generators of diagnostic X-ray generators
IEC 601-2-28	Particular requirements for the safety of X-ray source assemblies and X-ray tube assemblies for medical diagnosis
21 CFR 1020.30	Diagnostic x-ray systems and their major components
21 CFR 1020.31	Radiographic equipment
93/42/EEC	European Directive concerning medical devices (1993)

1.4 Environmental Data

Applicable ranges of temperature, humidity, and atmospheric pressure are reported here below both for operation and transport conditions.

	Ambient	Transport & Storage
Temperature	from 10 to 40 °C	from –20 to +50 °C
Relative Humidity	from 30 to 75%	10 to 90%
Pressure	from 700 to 1060 hPa	from 500 to 1060 hPa

1.5 Obligations of the Installer

Obligations of the Installer are:

- To make sure that the line voltage specified by the Manufacturer of the equipment is available and within the specified range.
- For safety reasons verify that a proper switch is available to disconnect from line voltage supply when needed during installation.
- Install and test the equipment with due diligence according to the installation instructions from the Manufacturer.
- To provide the Operator's Manual to the User.



1.6 Warning

X-ray equipment produce ionizing radiation that may be harmful if not properly controlled. It is therefore recommended that the equipment be operated by trained personnel only in accordance with existing law.

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.

1.7 Demonstration

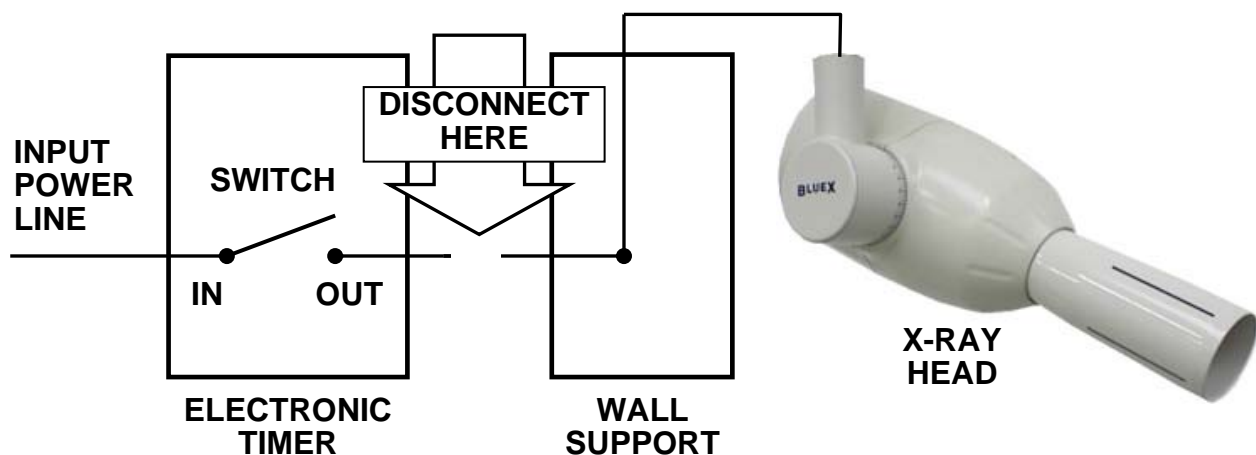
In order to use of the system for demonstration purposes radiation emission has to be inhibited by disconnecting the supply cables to the tube-head into the wall adaptor or into the timer.



Cables to be disconnected are those leaving the connection block towards the tube-head (“out” connections on the connecting block).

Make sure that the disconnected cables are properly insulated to prevent undesired contacts with live points.

This task has to be done by trained personnel only to avoid the risk of electrical shock.



2. TECHNICAL DATA

2.1 System Supply

Line Voltage	115 V (from 99 V to 132 V in sub-ranges depending on THA mounted) 230 V (from 198 V to 264 V in sub-ranges depending on THA mounted)
Line Voltage Working Range	Limited to the working range of the THA: 108 - 132 V for 93 202 01300 207 - 253 V for 93 202 01700
Line Fuse	Slow Blow: 6.3 A at 115 V, 4 A at 230 V, second fuse to be activated in case of two phases supply or mobile unit
Line Frequency	50/60 Hz \pm 2 Hz
Line resistance	\leq 0.4 Ohm at 115 V, \leq 0.8 Ohm at 230 V

2.2 Tube Housing Assemblies

Nominal Line Voltage	120 V for type 93 202 01300 230 V for type 93 202 01700
Nominal Line Current	6 A at 120 V for type 93 202 01300 4 A at 230 V for type 93 202 01700
Line Voltage Working Range	120 V \pm 10% for type 93 202 01300, 230 V \pm 10% for type 93 202 01700
Anode Voltage (peak tube potential)	70 kVp \pm 8% at nominal line voltage 66 kVp \pm 8% at nominal line voltage – 10% 74 kVp \pm 8% at nominal line voltage + 10%
Anode Current (tube current)	7.0 mA \pm 15% at nominal line voltage 5.3 mA \pm 15% at nominal line voltage – 10% 8.3 mA \pm 15% at nominal line voltage + 10%
Maximum Load	70 kVp, 7 mA, 3.2 s
X-ray Insert	3 electrodes, grid control action models: OCX/70-G, RFG070
Anode Material	Tungsten
Anode Angle	19° to the tube axis
Focal Spot	0.8 (EN 60336:1995-04)
Inherent Filtration	> 2.5 mm Al
Duty Cycle	1/30
Radiation Leakage	< 0.1 mGy/h a 1 m (< 11.5 mR/h a 1 m)

2.3 Beam Limiting Device

Round BLD	Metal cone with near-focus section
	Focus skin distance (FSD) 8.27”(21 cm)
	Circular radiation field size 2.35” diameter (6 cm)
Rectangular BLD	Metal body with near-focus section
	Focus skin distance (FSD) 8.27”(21 cm)
	Rectangular radiation field size 1.26”x1.65” (3.2x4.2 cm)

2.4 AutoSet Timer

Supply Voltage	110-120 for type 93 300 60200 220-240 for type 93 300 60100
Exposure factor	Exposure time in s, 18 steps from 0.06 s to 3.2 s (R10 scale)
	0.06 0.12 0.25 0.50 1.00 2.00
	0.08 0.16 0.32 0.64 1.25 2.50
	0.10 0.20 0.40 0.80 1.60 3.20
	Time in seconds is converted to number of mains pulses with 1 pulse precision (20 ms at 50 Hz, 16.6 ms at 60 Hz.)
Precision	± 0.02 s or 5% (whichever the greater)
Exposure factor setting	Automatic setting through tooth type selection and patient size, for use with traditional film or digital sensor, or manual setting moving up or down the scale with plus and minus keys.
Irradiation signal	Yellow light on hand-switch and on control panel plus acoustic buzzer
Hand-switch	Hand-switch with 3 m coiled cord, with remote mounting optional kit
Overall size	6” (15 cm) width, 9”½ (24 cm) height, 3”½ (9 cm) depth
Other features	Microprocessor controlled functionality Traditional film speed setting Digital sensor speed setting Zero-crossing power switching 3 s minimum waiting time Energy management for cool down time Optional kit with 33 ft (10 m) cable for remote mounting

2.5 Mechanical Suspension System

Wall Adaptor	4.72" (12 cm) width, 9.45" (24cm) height, 3.54" (9 cm depth)
Support Arm Length	Short: 11.8" (30 cm), medium:23.6" (60 cm), long: 31.5" (80cm)
Scissor Arm Useful Reach	54.3" (138 cm) with short support arm 66.1" (168 cm) with medium support arm 74" (188 cm) with long support arm
Mobile Stand	29" (74 cm) width, 24"½ (62 cm) depth 42" (107 cm) height, 65" (165 cm) total height with arm

2.6 Weights

Timer	3.7 lb (1.7 kg)
Tube-Head	14.5 lb (6.6 kg)
Round BLD	0.22 lb (0.1 kg)
Rectangular BLD	0.44 lb (0.2 kg)
Scissor Arm	25.8 lb (11.7 kg)
Short Support	6.2 lb (2.8 kg)
Medium Ext.	8.8 lb (4.0 kg)
Long Ext.	10.6 lb (4.8 kg)
Wall Adaptor	2.9 lb (1.3 kg)
Mobile Stand	64.8 lb (29.4 kg)

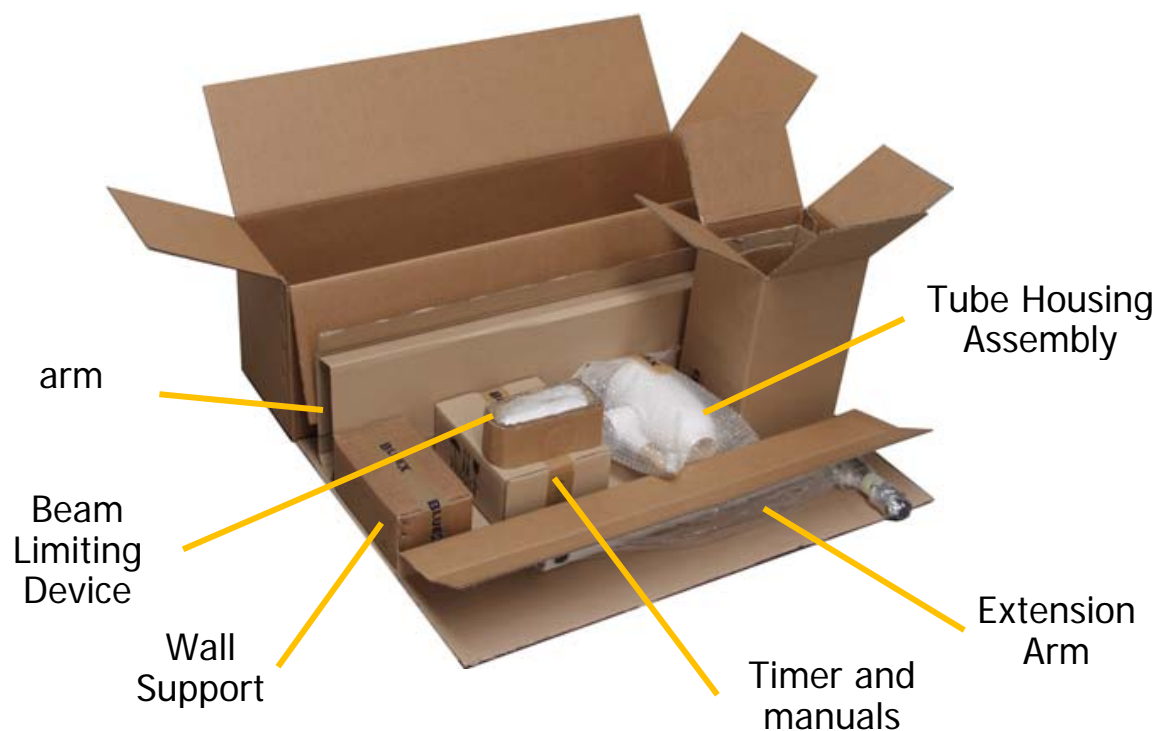
3. ASSEMBLY AND INSTALLATION

3.1 Wall Mounted Systems

3.1.1 Unpacking

Unpack the components of the system and check the following:

- A** Each item is in good conditions and was not damaged during transportation.
- B** All the items for the desired system configuration are available.
- C** The line voltage on the labels of timer and tube-head are corresponding to the existing local line voltage.



3.1.2 Structural Requirements

The wall adaptor has to be mounted in a convenient position on left or right side of the chair or on back wall (head of the patient).

The maximum useful reach is of 74” (188 cm) from the wall when combining a 31.5” (80 cm) support arm with a arm.

The wall adaptor can be mounted with 2, 4, or 6 bolts, depending on wall quality.

A Two bolts only (top and bottom central holes – T2, B2) are used when there is a solid slim column (e.g. iron mounting) with weak sides (e.g. wooden wall). Considering the requested safety factor, the top bolt has to withstand a load of 6000 N, comprehensive of a safety factor, i.e. about 1350 lbs or 612 kg. Proper screw to be selected for a solid connection to the wall. Classes ISO 8.8 (M 8, M 8x1, M 8x1.25) or SAE Grade 5 (5/16” 18UNC, 5/16” 24 UNF) are recommended.

B Four bolts, two on top sides (T1, T3) and two on bottom sides (B1, B3) is the regular mounting for solid (concrete) wall, but also on large metal plate. Considering the requested safety factor, each bolt at top has to withstand a load of 3000 N, comprehensive of a safety factor, i.e. about 675 lbs or 306 kg.

Proper expansion screw to be selected for a solid connection to the concrete wall; the permissible load of each screw has to be greater than 308 lbs (about 140 kg).

- On solid concrete use heavy duty metal anchors.
- On hollow bricks use injection chemical fixing.

C Six bolts, three on top (T1, T2, T3) and three at bottom (B1, B2, B3) are required when the wall is not solid enough and the load has to be distributed on more points. Considering the requested safety factor, each bolt at top has to withstand a load of 2000 N, comprehensive of a safety factor, i.e. about 450 lbs or 204 kg.

In case the wall is not in condition to withstand the indicated load, corrective actions can be evaluated by adoption of reinforcing plates:

D Large plate to fit vertical supports at 16” distance, with 4 mounting holes and one cable opening for the wall mount in the middle.



E In case of a thin (wooden) wall not solid enough, the use of a steel counter plate 2 mm thick can be the solution.

Make sure that the wall is solid enough to carry the load.

F The use of two reinforcing steel plates of about 4 times the surface of the wall adaptor, one by each side of the wall, can help when a single plate looks not adequate; additional bolts have to be used to hold together the two plates.

Make sure that the wall is solid enough to carry the load.

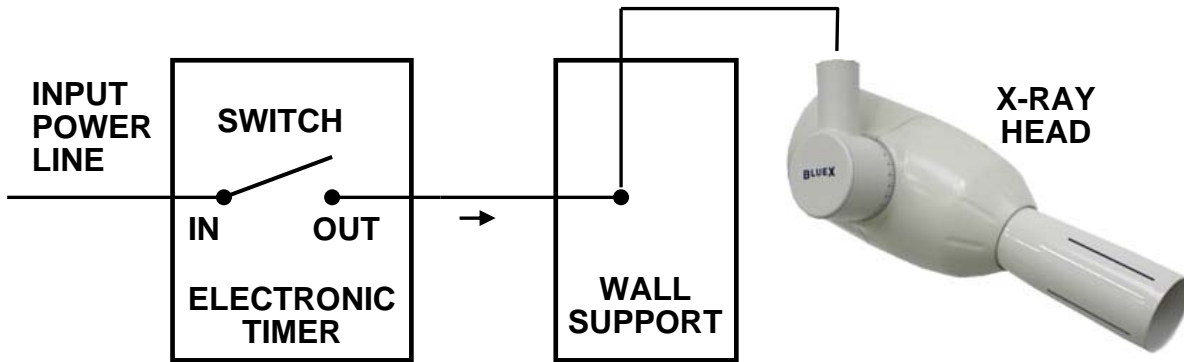
Recommended Bolts		
Diameter	Class	Core Section mm²
M 8X1.25	ISO 8.8	36.6
M 8X1	ISO 8.8	39.2
5/16" – 18 UNC	SAE- Grade 5	33.8
5/16 –24 UNF	SAE- Grade 5	37.41

**INSUFFICIENT WALL OR HARDWARE STRENGTH
MAY CAUSE THE WALL MOUNT TO PULL OUT FROM
THE WALL AND THE FULL SYSTEM TO FALL ON TO
THE PATIENT OR THE OPERATOR CAUSING INJURIES.**



3.1.3 Electrical Requirements

The power line cable must be connected to the input terminals (IN) of the timer to supply the timer itself and to make available power for the X-ray head at the output terminals (OUT), upon request by the operator (via the hand switch). Power to the X-ray head is thus controlled by the timer (acting as a SWITCH).



The cables (2 poles plus ground) to connect the power line to the timer and the timer to the wall adaptor are not provided. Cables with large section conductors have minimum electrical resistance and voltage drop.

Wire Type	Cross Section Area	Resistance/m	m/0.05 Ohm
AWG 14	2.08 mm²	0.00829 Ohm/m	6.0 m
AWG 12	3.31 mm²	0.00521 Ohm/m	9.6 m

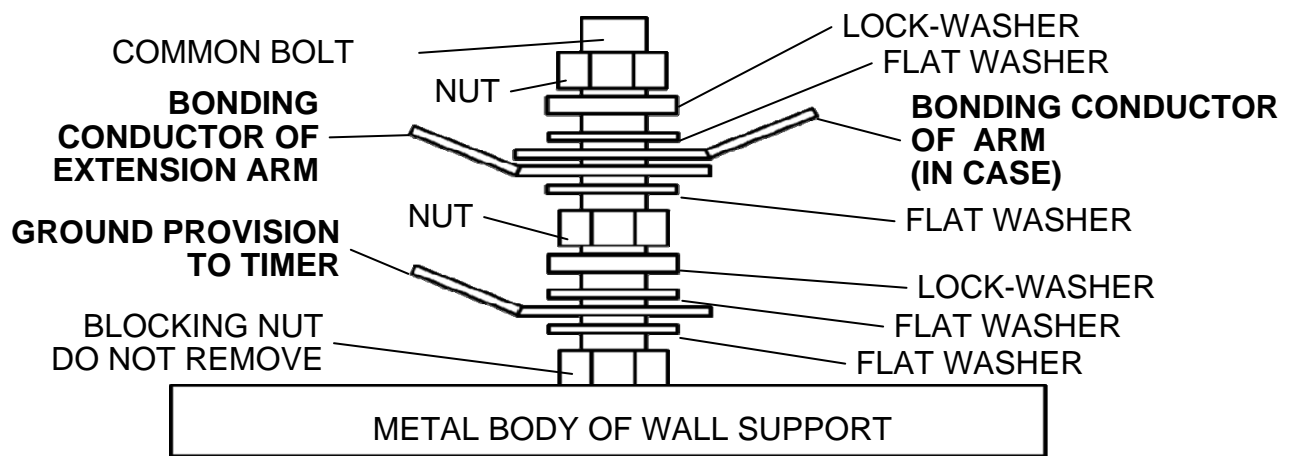
The resistance between the ground provision in the connecting block of the timer and the metal body of the tube housing assembly has not to exceed 0.1 Ohm. Proper section of the yellow green wire to be used in case remote mounting of the timer.



The wall adaptor is provided with a common bolt for bonding and grounding blocked in place with a nut which has not to be removed.

The grounding conductors to be connected as indicated below.

- First the conductor to ground provision in the connecting block of the timer (flat washer, ground provision, flat washer, lock-washer, nut).
- Second the bonding conductor of support arm plus, in case, the one of the cable in the arm (flat washer, bonding conductors, flat washer, lock-washer, nut).



3.1.4 Mounting and Connecting Sequence

- A** Mount the Wall Adaptor
- B** Mount the Timer
- C** Mount the Support Arm
- D** Mount the Arm
- E** Connect the Wall Support
- F** Connect the Timer
- G** Connect the Hand-Switch
- H** Optional Remote hand-Switch
- I** Mount and connect the Tube-head
- J** Mount the Beam Limiting Device
- K** Final Tuning and Set-Up

3.1.5 Mounting the Wall Adaptor

A Take away the plastic cover removing the screws under the logo label.

B Use the Wall Support plate or a template to mark the holes on the wall.
Please note that the timer can be mounted close to the Wall Support on the right side or in a remote position. Cabling should have been laid out accordingly.

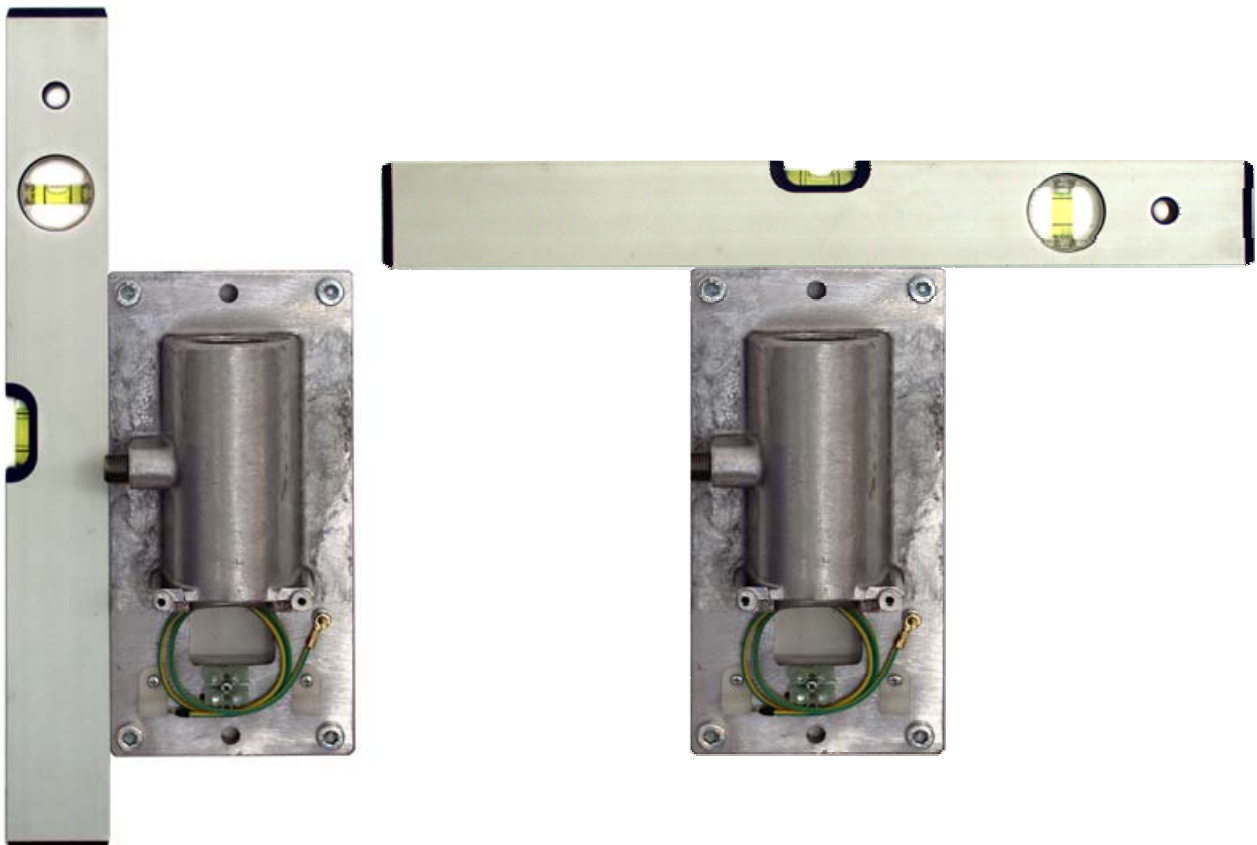
C Make the holes in the wall according to the applicable type of mounting with two, four bolts, or six bolts, with or without reinforcing plate.

D Slide the logo-strip out from the plastic cover to access the screws and remove it from the metal frame.

E Mount the metal frame on the wall using proper heavy-duty metal anchors and make sure that the power cable enters from behind.

F Secure it to the wall ensuring it is leveled. Improper leveling might cause the arm to move and swing out of position.

G Perform wire connection and final set-up complying with recommended sequence of actions reported in the following.



3.1.6 Mounting the Timer

- A** Use the mounting plate or the template to mark the holes on the wall.
- B** Remove the plastic cover after having taken away the blocking screws behind the logo strip. Pay attention when disconnecting the flat cable of the control panel from the control board.
- C** Drill the four holes in the wall and secure the timer making sure it is leveled. Cabling should have been laid out in accordance to mounting requirements.
- D** Perform wire connection and final set-up complying with recommended sequence of actions reported in the following.



3.1.7 Mounting the Support Arm

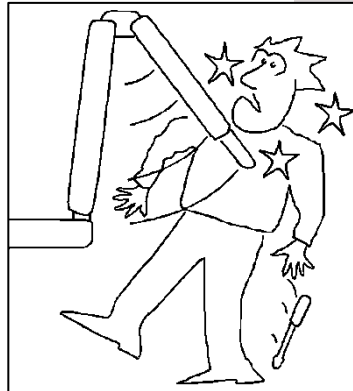
- A** Unpack the extension arm and check for completeness of parts.
- B** Do not remove the rope to pull the cable of the Arm to the Wall Adaptor through the Extension Arm.
- C** Push back the cylinder of the side friction not to interfere, lightly grease the shaft of the extension arm and insert it into the wall adaptor.
- D** Mount the rotation end-stop spacer and close the side friction without tightening.



3.1.8 Mounting the Scissor Arm



WARNING. THE SPRINGS IN THE ARM MAY CAUSE INJURY TO THE INSTALLER AS WELL AS DAMAGE TO THE ARM ITSELF IF NOT HANDLED PROPERLY. DO NOT REMOVE BINDING STRING UNTIL WHEN NECESSARY



- A** Light grease the shaft at the base of the arm and make sure the ring spacer is in place; push back the cylinder of the friction into the support arm not to interfere during the insertion of the shaft.
- B** Secure the trailing rope to the end of the electrical cable of the Scissor Arm.
- C** Pull the other end of the trailing rope to drive the electrical cable of the Scissor Arm through the Support Arm out into the Wall Adaptor.
- D** Hold the opening section of the Scissor Arm, carefully remove the safety string and allow the arm to open slowly, away from people.



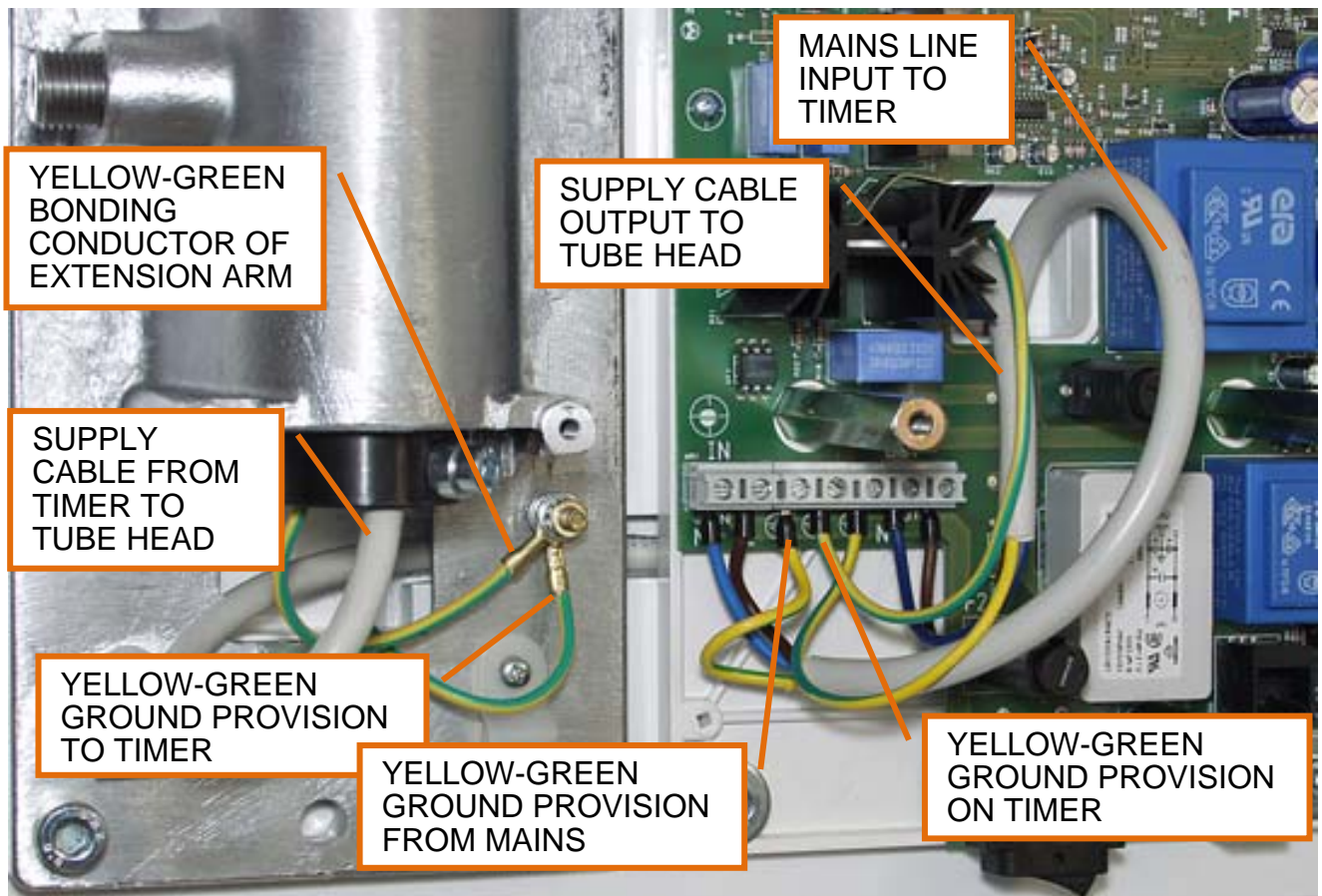
- E** Perform final set-up complying with recommended sequence of actions reported in the following.



CONNECT TO TIMER
WARNING
 IRRADIATION DEVICE

NEVER CONNECT DIRECTLY TO MAINS

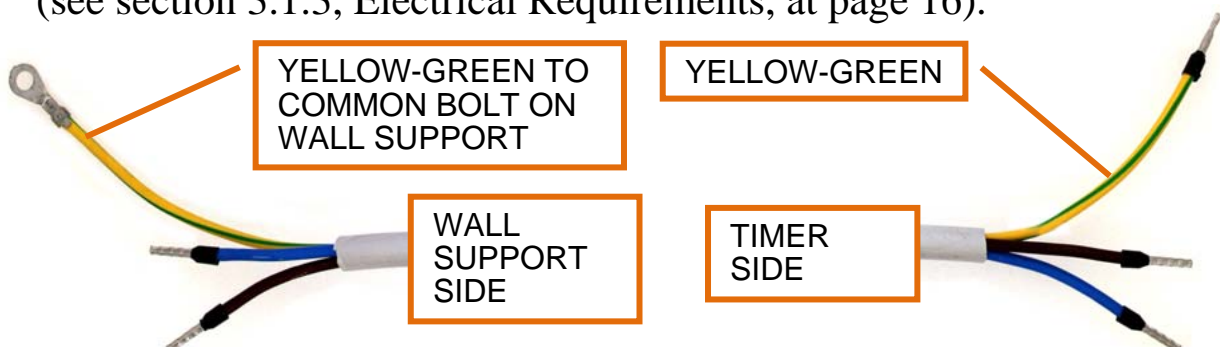
3.1.9 Connecting the Wall Adaptor with Timer at side



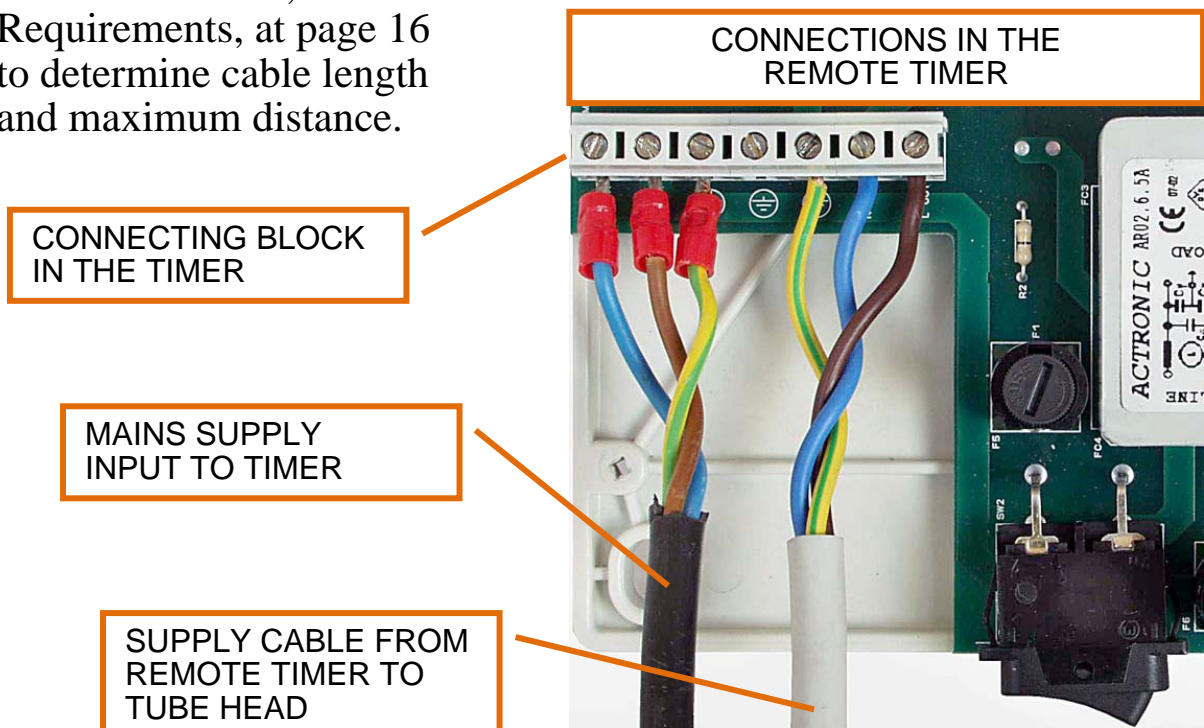
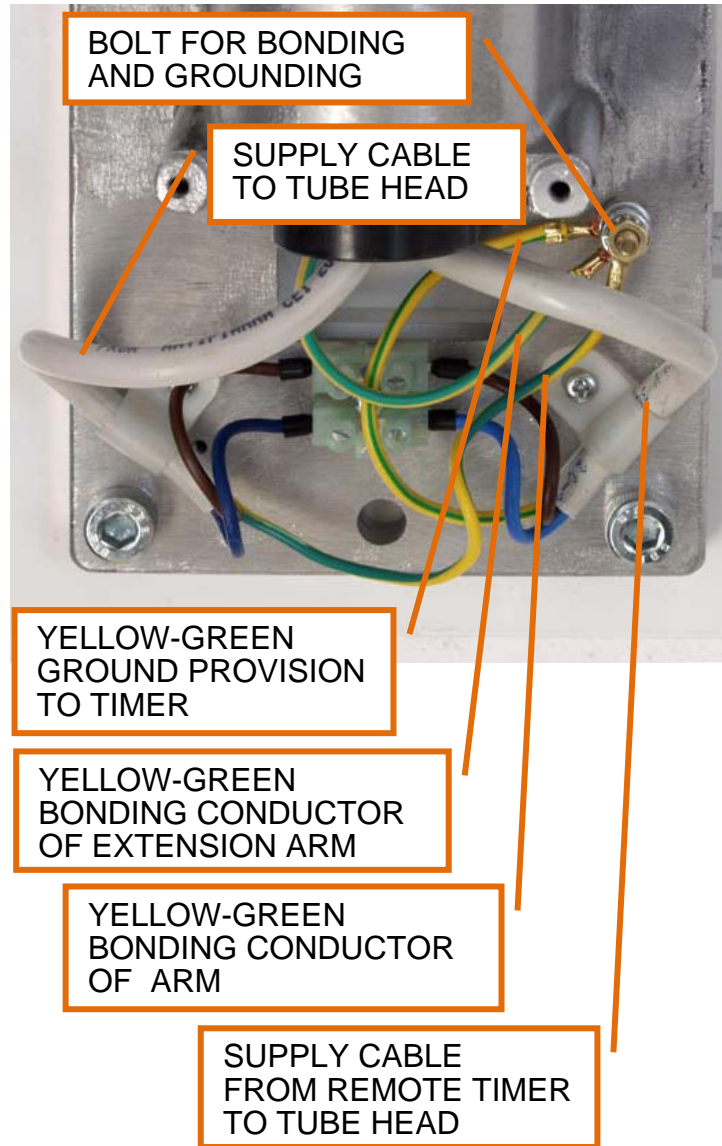
- A** Pass the conductor of the grounding provision (already connected to the common bolt) into the timer for connection to the central ground point in the connecting block (protective earthing).
- B** Connect the grounding provision of the support arm to the common bolt on the wall plate (flat washer, ground provision, lock-washer, nut).
- C** Pass through the supply cable of the scissor arm into the timer for connection to the OUT positions (supply cable output to tube-head).

3.1.10 Connecting the Wall Adaptor with Timer remote

- A** Prepare the terminations of the cable for remote connection of timer with tips to fit the connecting blocks in timer and connecting blocks plus the common bolt for grounding in wall support.
- B** Make sure the copper section of the yellow green wire is large enough (see section 3.1.3, Electrical Requirements, at page 16).

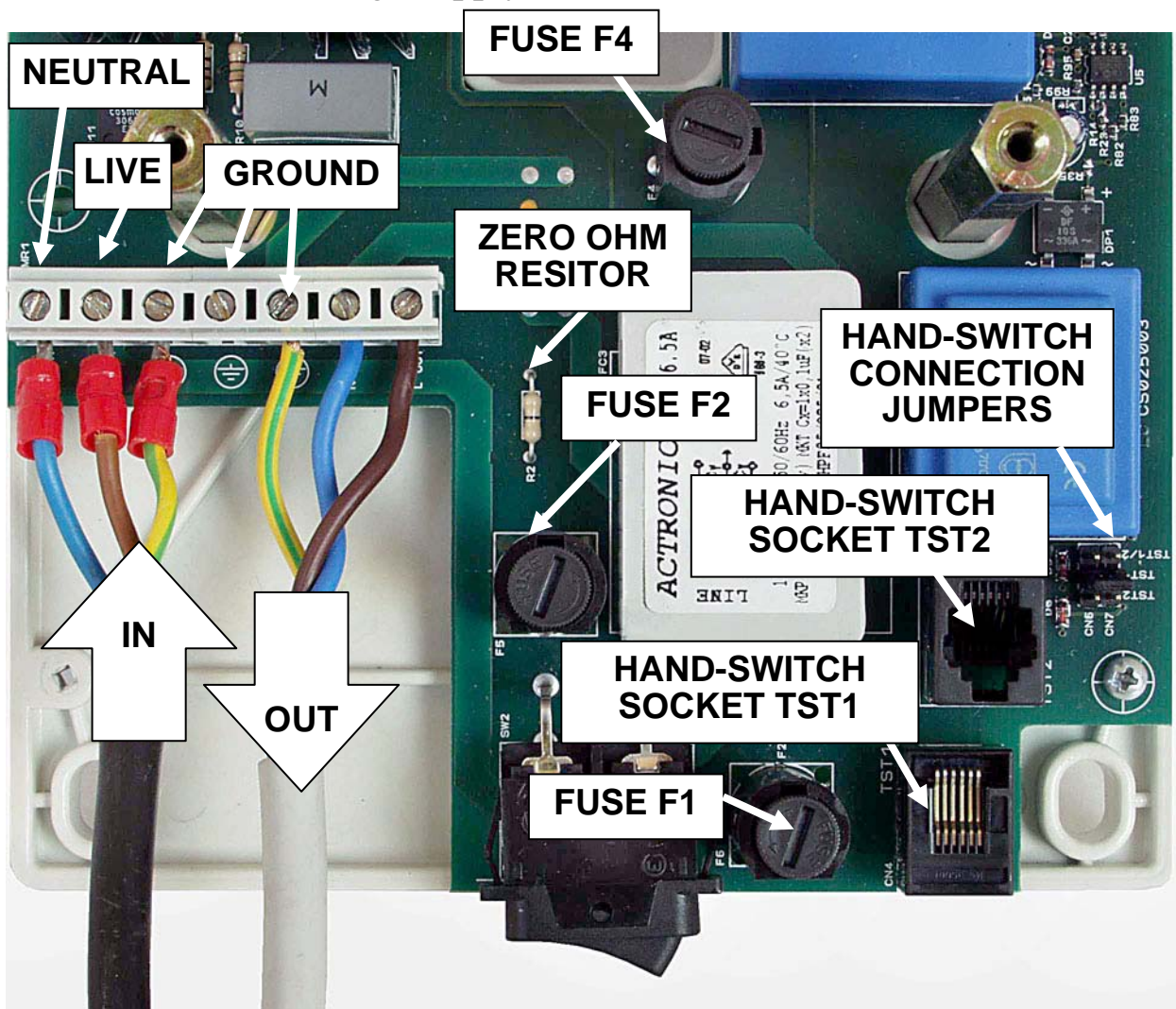


- C** Remove from the common bolt for bonding and grounding on the wall adaptor the existing cable for ground provision.
- D** Connect the cable for remote connection of the timer by placing the ground wire as first conductor on the common bolt for bonding and grounding; block with washers and nut.
- E** Place the phase and neutral wires to the connecting block.
- F** Connect to the common bolt for bonding and grounding the bonding conductor of the support arm and the one of the cable of the scissor arm.
- G** Connect the phase and neutral conductors of the supply cable in the scissor arm to the connecting block.
- H** See section 3.1.3, Electrical Requirements, at page 16 to determine cable length and maximum distance.



3.1.11 Connecting the Timer

A Turn-off the line voltage supply line.



B Connect the three wires from the line voltage supply to the terminal block (IN on the left) but do not connect any outgoing wire (OUT on the right) to Wall Adaptor.



C Make sure that the “live” conductor is the “hot” one:

- a Connect an AC voltmeter or a test light between the block terminal “live in” and “ground”.
- b Turn line voltage supply “ON”. If full line voltage is measured (test lamp lights) the wiring is correct. If not turn line voltage supply “OFF”, reverse “live in” and “neutral in” wires and repeat the measurement; eventually the full line voltage should be read between “line” and “ground” (test lamp lights).
- c Make sure no voltage is read between “neutral in” and “ground”; if not check line voltage distribution.

D Test the timer for full functionality keeping the output cables disconnected so that power is not provided to the load.

E Connect the load.

- Turn OFF the line voltage supply line,
- Connect the three wires of additional cable outgoing to the Wall Adaptor, Scissor Arm, Tube Housing Assembly. Live and neutral wires to the scissor arm (tube-head) can be interchanged.

Fuses of the AutoSetTimer		
Ref.	AutoSet 115 V	AutoSet 230 V
F1	6.3 AT 5x20	4AT 5x20
F2	6.3 AT 5x20	4AT 5x20
F3	315 mAT 5x20	315 mAT 5x20
F4	80 mAT 5x20	50 mAT 5x20

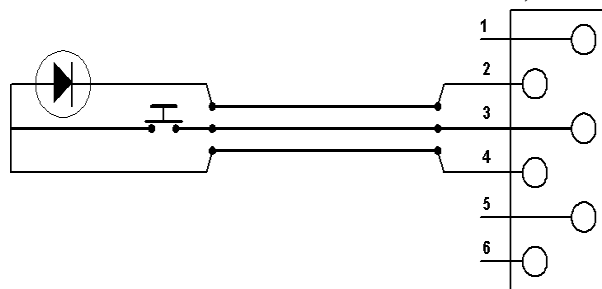
3.1.12 Connecting the Hand-Switch

- A** The hand-switch is provided with a 3 m coiled cord to be plugged one side in the hand-switch, the other side in the lower left corner of the timer’s board, either externally (connector TST1) or internally to the timer (connector TST2). Internal connection is for remote hand-switch or for additional control safety switches.
- B** Jumpers are available to activate properly the hand-switch connection:
- a Position TST1 to enable external socket TST1,
 - b Position TST2 to enable the internal socket TST2,
 - c Position TST1/2 f to enable the internal and the external sockets.

3.1.13 Optional Remote Hand-Switch



The connection of the wires is here indicated. The wires of the switch are number 3 and 4 (those in the middle of the connector).



The hand-switch can be remotely mounted by making use of the optional kit made of a remote box (wall holder) and connection cable.

- The wall holder (remote box) has a hook to hold the hand-switch and a plug to connect the coiled cable.
- A cable 10 m long is provided with a plug on one side, to connect to the socket on the timer, and free wires on the other side.

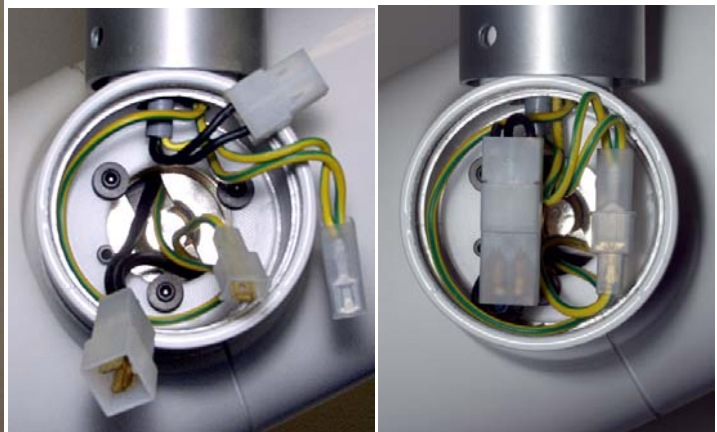
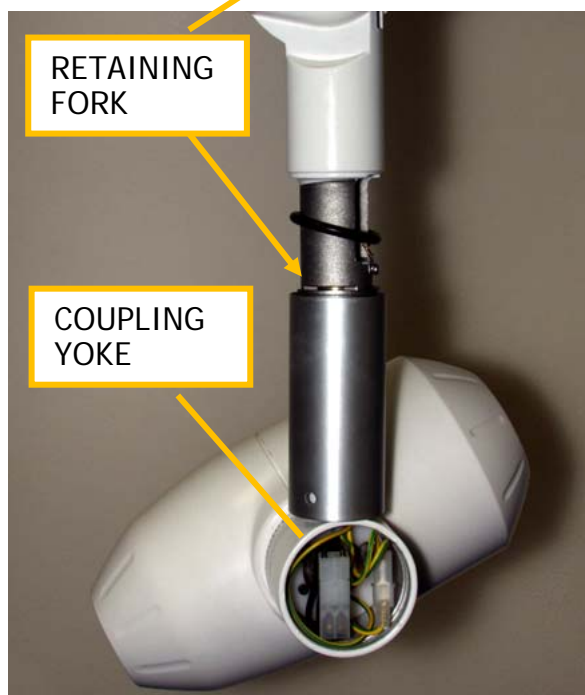
3.1.14 Mounting and Connecting the X-ray Head



A Remove the handgrip pipe from the arm and place it onto the tube-head shaft of the coupling yoke.



B Lubricate the shaft, insert it into the arm passing the cables into the coupling yoke, then hold it in place with the retaining fork.



C Attach the connectors of the supply and grounding wires and push them into the side opening of the coupling yoke.

D Pull down the O-ring and push-up the handgrip pipe, then fix it in place with the screw at bottom.

E Verify smooth movement of the tube head around its vertical and horizontal axis. Tune side friction if necessary referring to section 4.4, Maintenance of , at page 37 for details.

F Mount the cover on the yoke opening eventually.

3.1.15 Mounting the Beam Limiting Device

A Mount the beam limiting device on the tube-head and lock it close with a clock-wise rotation.

3.1.16 Final Tuning and Set-Up

A Remove the line voltage fuse(s) from the timer (Fuse 1 and Fuse 2).

B Tune friction screw in Wall Adaptor for rotation of Support Arm (see section 4.1, Maintenance of Wall at page 34 for details).

C Tune friction screw in Support Arm for rotation of Scissor Arm around its vertical axis (see section 4.2, Maintenance of Support Arm, at page 34).

D The friction points in the scissor arm and those for the rotation of the tube-head around its horizontal axis are tuned in factory. Should you need to repeat the procedures refer to sections 4.3, Maintenance of Scissor Arm, at page 35 and 4.4, Maintenance of , at page 37, respectively.

E Make sure the Timer switch is in the “OFF” position.

F Set the dip switches SW2 as indicated in the following to define:

- a Enable/disable correction of exposure factor to compensate fluctuations of line voltage.
- b The nominal line voltage of the tube-head (see label).
- c Set the pre-heating time according to type of X-ray insert used in the tube-head assembly; the measured value is marked in front of the tube-head.



G Put back the line voltage fuse(s).

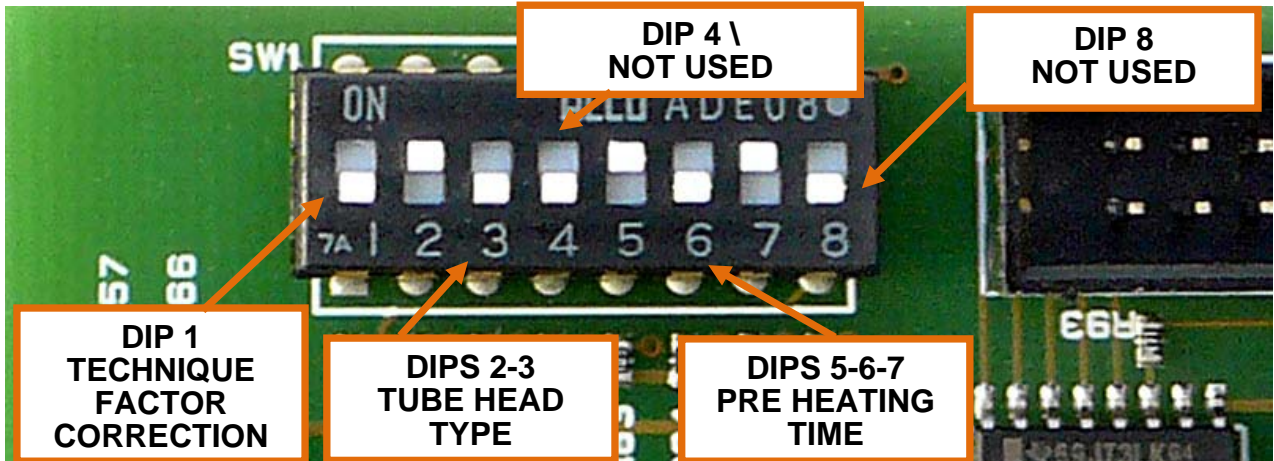
H Put back all plastic covers and logo strips.

I Connect the system to the line voltage by switching the general line voltage switch on and/or plug the power cord into the wall socket.

J Switch the timer “on”.

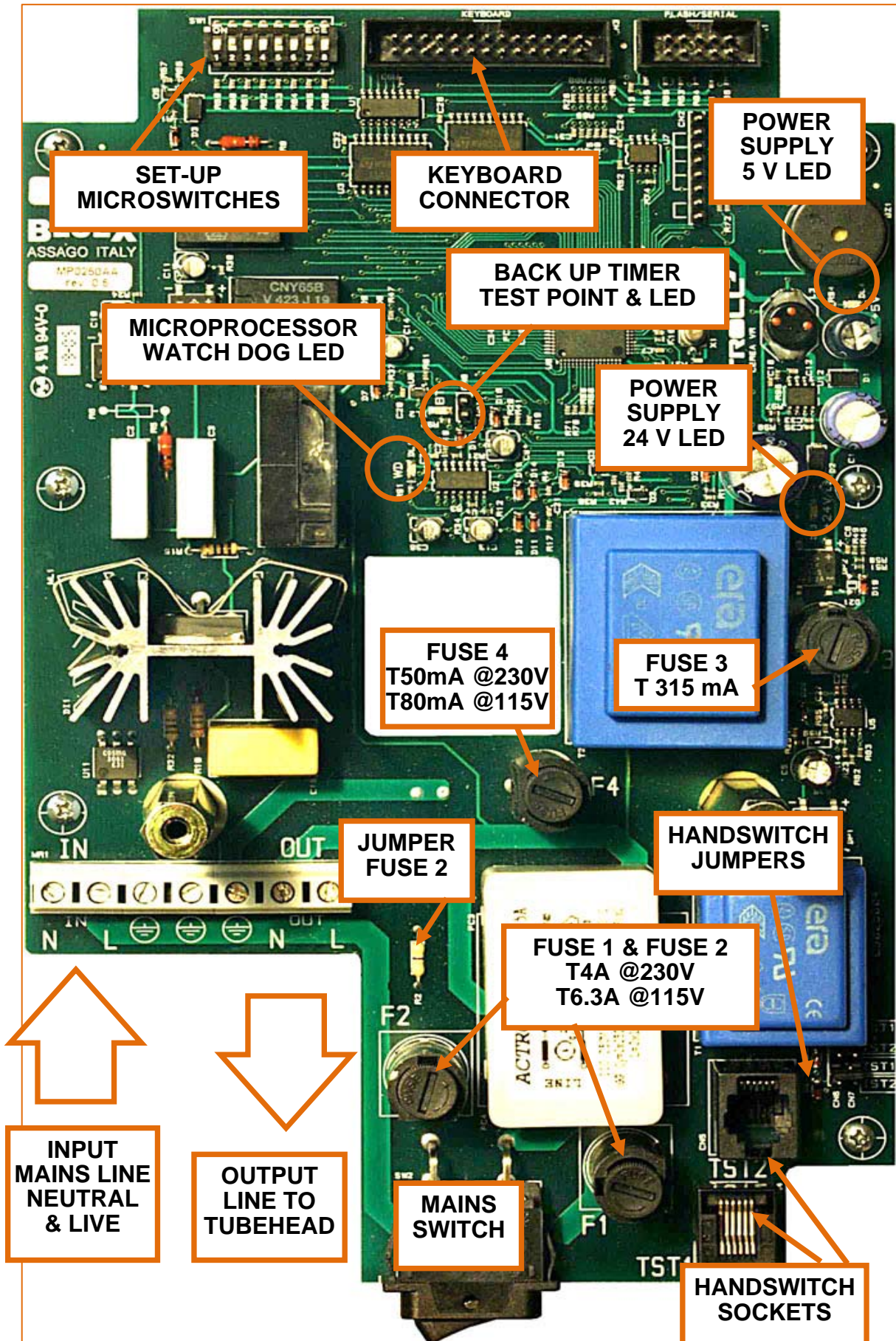
The system is now ready for Functional Check as described in the Operator’s Manual.

3.2 Dip Switch Setting



DIP 1 Technique Factor Correction		DIPS 5 – 6 – 7 Pre Heating Time	
Disabled		100 ms	
Enabled		120 ms	
DIPS 2- 3 Tube Head Type		140 ms	
110 or 220 VAC		160 ms	
115 or 230 VAC		180 ms	
120 or 240 VAC		200 ms	
127 or 250 VAC		220 ms	
DIP 4 Not used		240 ms	
DIP 8 Not used			

3.2.1 Layout Power Board Timer

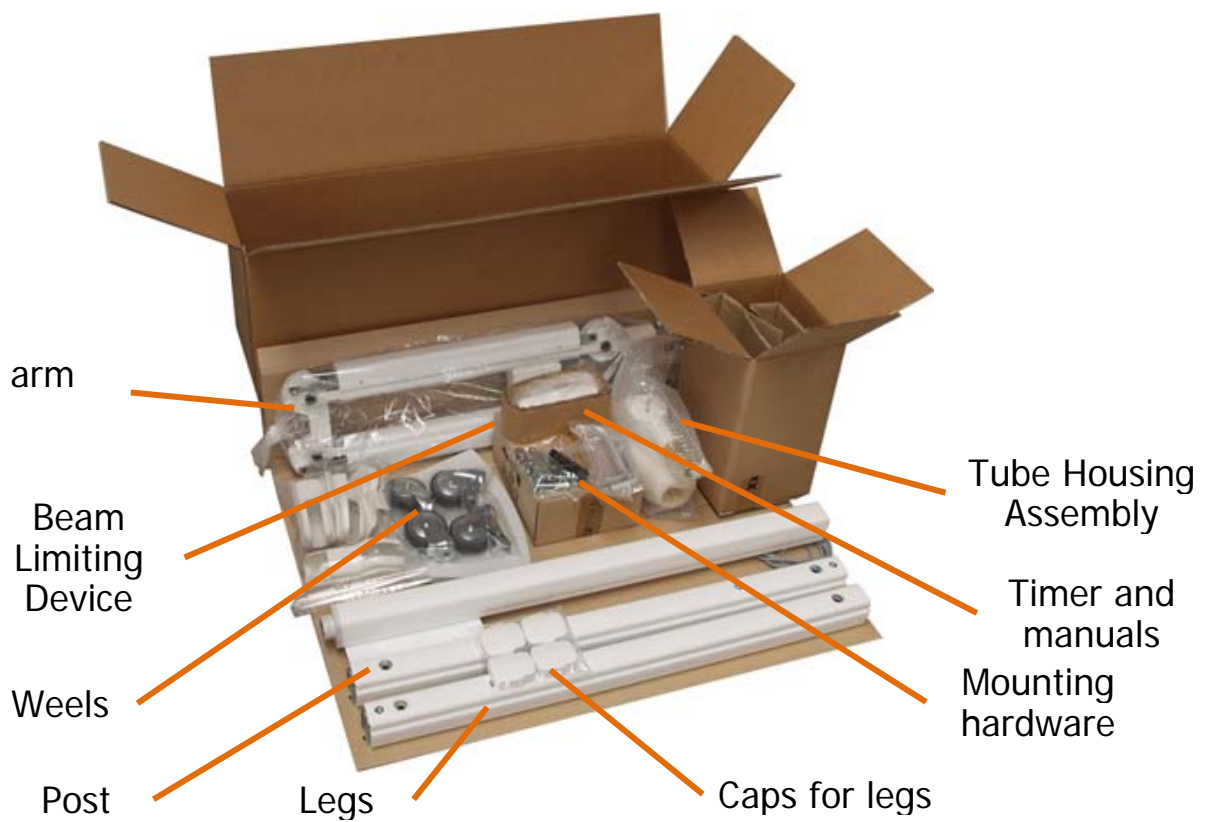


3.3 Mobile Systems

3.3.1 Unpacking

Unpack the components of the system and check the following:

- A** Each item is in good conditions and was not damaged during transportation.
- B** All the items for the desired system configuration are available.
- C** The line voltage on the labels of timer and tube-head are corresponding to the existing local line voltage.



3.3.2 Room Preparation

Make sure that a wall socket is available close to the dental chair in reach of the mobile X-ray equipment to be connected.

Such a socket has to be provided with a connection to the protective grounding.

Due to different standards for different countries the line voltage cable of the mobile system may be supplied without plug to be added matching the existing wall socket.

3.3.3 Mounting and Connecting Sequence

The recommended sequence to mount and connect system modules is listed here.

- A** Assemble the Mobile Stand.
- B** Mount the Scissor Arm.
- C** Mount the Timer.
- D** Connect the Line Voltage Cable .
- E** Connect the Timer.
- F** Activate second Fuse.
- G** Mount and Connect the Tube-Head
- H** Mount the Beam Limiting Device
- I** Final Tuning and Set-Up

3.3.4 Assembling the Mobile Stand

- A** Mount the legs below the central base.
- B** Mount rear wheels and front wheels with brakes.
- C** Attach the pole with timer plate.
- D** Complete the stand with cable holder and handles



3.3.5 Mounting the Scissor Arm



- A** Loosen the friction and push back the cylinder of the same not to interfere during the insertion of the shaft.
- B** Insert the scissor arm.
Refer to section 3.1.8 at page 20 for details.

3.3.6 Mounting the Timer

The timer is blocked in place with four bolts.

3.3.7 Connecting the Line voltage Cable

- A** The line voltage cable for the mobile has to be completed with local plug.
- B** The power supply cord bonding conductor has to be blocked (first) to the common bolt for bonding and grounding using lock-washer and nut.
- C** The grounding wire for the timer is then placed on the same common bolt and blocked (second) with lock-washer and nut.
- D** Connect the grounding wire for the timer to the ground provision on the terminal block of the timer and the two line wires of the power cord to the input points of the terminal block of the timer.



3.3.8 Connecting the Timer

For the connection of the output cable to the timer please refer to section 3.1.10 at page 23.

3.3.9 Activation of Fuse 2

Units provided with supply cord and plug must be equipped with fuses on both line phases. The activation on the second fuse is done by cutting the Jumper Fuse 2 (zero Ohm resistor) close to Fuse F2. See position on layout in section 3.2.1 at page 28.



3.3.10 Mounting and Connecting the Tube-Head

Refer to section 3.1.14 at page 24.

3.3.11 Mounting the Beam Limiting Device

Refer to section 3.1.15 at page 26.

3.3.12 Final Tuning and Set-Up

Refer to section 3.1.16 at page 26.

4. MAINTENANCE

Here in the following the list of recommended maintenance actions to keep the IntraOs 70 system in compliance with the Performance Standard.

It is the responsibility of the User to maintain the equipment in compliance with the standard. Failure of the User to properly maintain the equipment may relieve the Manufacturer, or its Agent, from responsibility for any injury, damage or non compliance which may result.

Maintenance for the IntraOs 70 system to be done regularly by a service technician at least once every 24 months, with regular checks performed by the operator every year.

Any defect or malfunction should be corrected immediately by qualified personnel with adequate training.

WARNING. ANY DEFECTIVE ITEM AFFECTING A SAFE USE MUST BE REPAIRED OR REPLACED



Only original certified components and spare parts must be used for repairs or replacements.

Correction of damages to the identification labels to be handled with the Manufacturer.

Any defect or non-compliance must be reported promptly to the Manufacturer or to its Local Agent.

ALWAYS DISCONNECT THE SYSTEM FROM THE LINE VOLTAGE SUPPLY USING THE GENERAL LINE VOLTAGE SWITCH FOR THE ROOM WHERE THE EQUIPMENT IS LOCATED BEFORE PERFORMING ANY MAINTENANCE ACTIVITY.



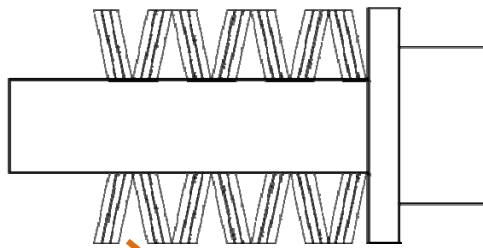
AVOID USING LIQUID OR SPRAY DETERGENTS WHICH MAY ENTER INTO THE EQUIPMENT AND CAUSE CORROSION.



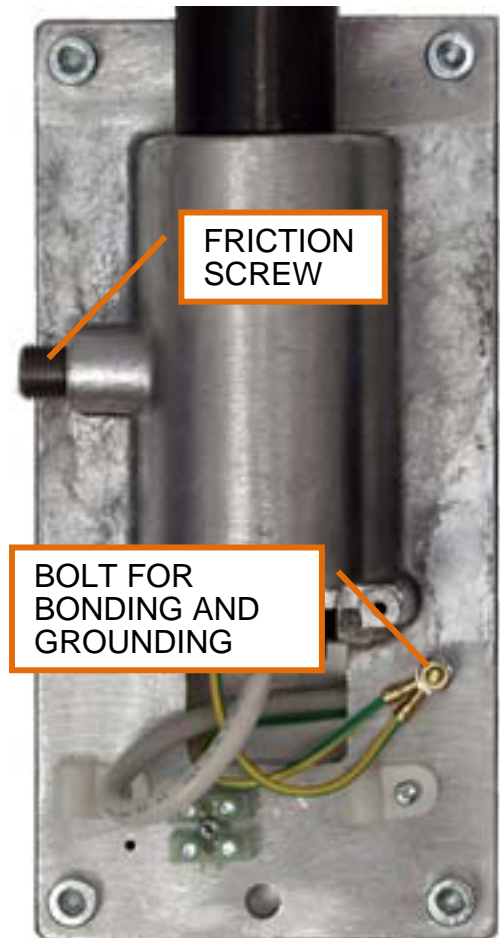
AVOID THE USE OF SOLVENTS OR CORROSIVE DETERGENTS WHICH CAN DAMAGE PAINTED SURFACES AND PLASTIC COVERS.



4.1 Maintenance of Wall Adaptor



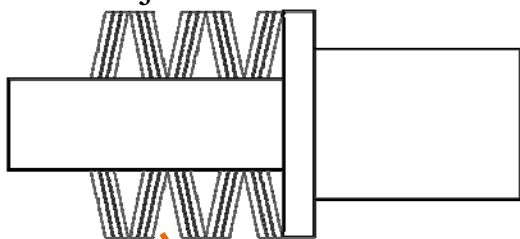
POSITION OF 21 DISK SPRINGS IN FRICTION SCREW 7 GROUPS OF 3



- A** Remove the cover and verify that the mounting is closely connected to the wall and stays firm and steady during the movements of the system.
- B** Verify for proper connection of grounding wires to the common bolt.
- C** Check friction during rotation of Support Arm and adjust if needed.
- D** Verify that the technical label with identification data outside the plastic cover at bottom is in place and is readable.

4.2 Maintenance of Support Arm

- A** Slide partially out the support arm from wall mount, inspect for wear of the joint and lubricate for smooth rotation.

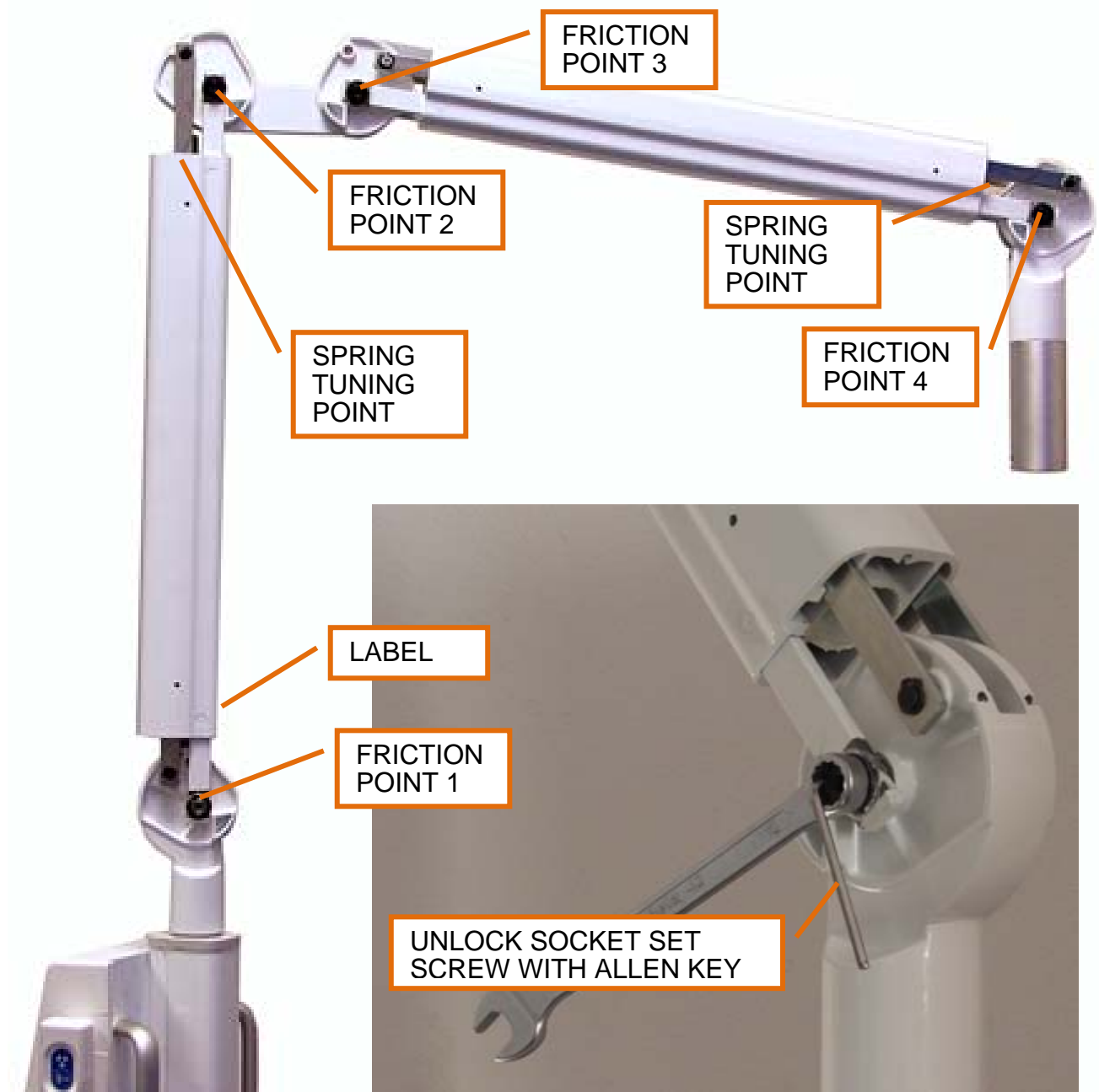


POSITION OF 15 DISK SPRINGS IN FRICTION SCREW 5 GROUPS OF 3



- B** Check friction during rotation of Scissor Arm and adjust relevant screw if needed.
- C** Verify that the technical label with identification data is in place and is readable.

4.3 Maintenance of Scissor Arm



A Balance the arms (2 sections) and tune frictions (4 points) if needed in normal conditions with tube-head mounted.

B To balance the scissor arm, for each arm's section:

- a Remove plastic covers on the joints.
- b Reduce the friction at the 2 friction points by loosening the socket set screw (allen) into the female friction pin which is blocking male and female pins together, then loosen them to reduce friction.
- c **WARNING.** Trying to loosen the friction pins without having loosen the socket set screw might lead to breaking the friction pins.

- d Tune the springs using an allen key for even balancing with arm



section in intermediate position.

- e Tighten the two friction pins for little resistance to the movement, and eventually tighten the socket set screw (allen) into the female friction pin to block male and female friction pins together.

- C** Specifically for the scissor arm, at least every 24 months in case of normal use or after every 5000 cycles performed, have the service technician inspect for wear of pins and levers.

- a Remove plastic covers on the joints.
- b Check for wearing out of pin and levers, starting from the joint at the base of the arm.
- c Make sure no part is loose and no vibrations are occurring during movements.
- d Apply silicon spray lubricant if needed.
- e Replace the worn out parts or the arm itself if they appear damaged.

- D** To replace defective pins or levers

- a have the tube-head disconnected with arm fully open to avoid injuries for sudden opening.
- b Loosen completely the springs in the two sections of the arm before extracting pins or removing levers.

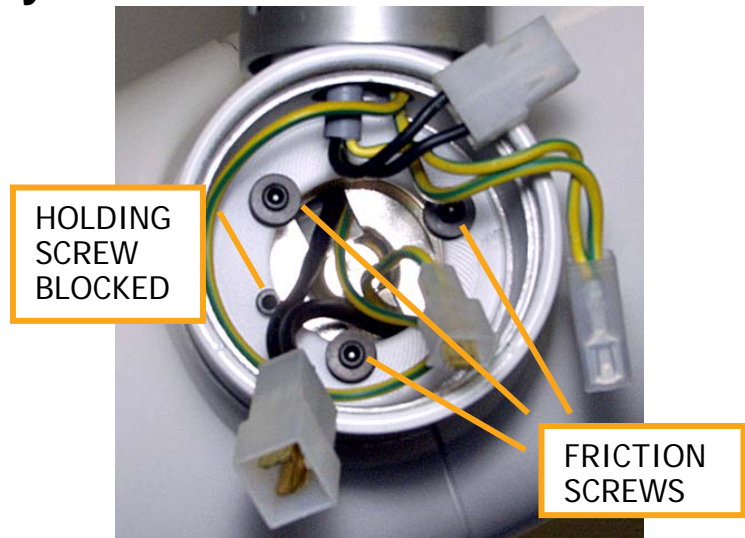
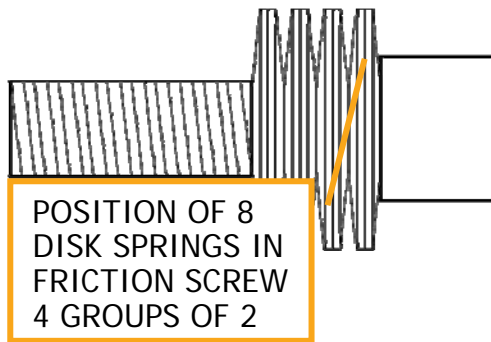
- E** Mount back the tube-head if removed and secure it with the retaining fork.

- F** Slide partially out the scissor Arm from the Support Arm, inspect for wear of the vertical joint and lubricate for smooth rotation.

- G** Verify that the label with identification data is in place and is readable.



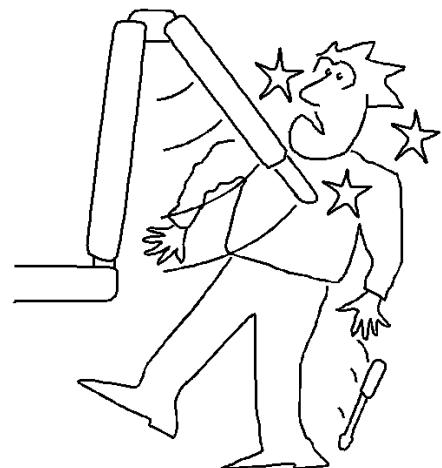
4.4 Maintenance of X-ray Head



- A** Inspect for damage/wear to the X-ray tube-head and support system.
- B** Inspect for oil leakage. Replace tube-head if necessary.
- C** Check for position stability. If necessary remove the cap on the yoke side, tune the three friction screws (with disk springs) to be moderately tight for smooth rotation.
The fourth one without disk springs must be blocked in place
- D** Check that electrical cables are correctly twisted and not damaged or worn down.
- E** Verify that the technical label with identification data is in place and is readable.
- F** Dismount the tube-head from the arm and lubricate the pin for smooth rotation.

Warning: remove the tube-head with the arm completely open to avoid the risk of injuries.

- G** Check the retaining clip and replace if worn down. Do not mount the tube-head until all checks of the suspension system are completed.



4.5 Maintenance of Beam Limiting Device

- A** Verify that the collimator is properly mounted and firmly closed.
- B** Verify that the internal cone is not damaged. Replace the collimator if necessary.
- C** Verify that the technical label with identification data is in place and is readable.

4.6 Maintenance of Timer

- A** Inspect the panel for damages on the surface.
- B** Inspect the cable of the exposure switch for wear.
- C** Check that all lights (except the yellow one) are working when the system is switched on.
- D** Perform a Functional Check as described in the Operator’s Manual. This check includes verification of: a) proper setting of technique factor, b) proper setting of anode current, c) yellow light, d) buzzer, e) alarm A07 for “Exposure push button pressed at power on”, e) alarm A08 for “Exposure stopped by the operator”.
- E** Verify that the fuses used mounted comply with those listed below.
- F** Verify that the technical label with identification data is in place and is readable.

Table of Fuses for Timer AutoSet		
Fuse	115 V	230 V
F1	6.3 AT 5x20	4 AT 5x20
F2	6.3 AT 5x20	4 AT 5x20
F3	315 mAT 5x20	315 mAT 5x20
F4	80 mAT 5x20	50 mAT 5x20

4.7 Checking Filament Pre-Heating Time

During the life of the system the wearing down of the filament may result in a different pre-heating time (PHT). The value set at installation needs therefore to be verified and in case corrected.

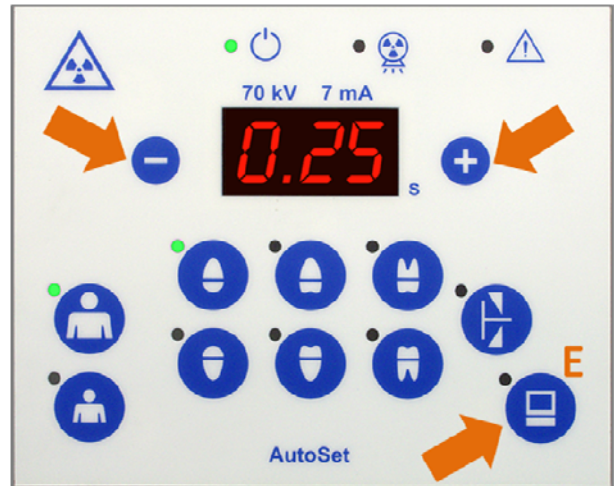
- A** At a fixed distance measure the X-ray dose for exposure of 2.0 s (nominal irradiation of 100 pulses at 50 Hz, 120 at 60 Hz).
- B** At same distance measure the dose for exposure of 0.2 s (nominal irradiation of 10 pulses at 50 Hz, 12 at 60 Hz).
- C** If dose at 0.2 s is 1/10 of dose at 2 s, the value set for PHT is fine.
- D** If dose at 0.2 s is lower than 1/10 of the dose at 2 s, PHT has to be increased. Proceed at steps of 20 ms until fine.
- E** If dose at 0.2 s is higher than 1/10 of the dose at 2 s, PHT has to be reduced. Proceed at steps of 20 ms until fine.



4.8 Special Service Functions

A Digital Volt Meter. This function allows the user to display the line voltage level and the line frequency alternating.

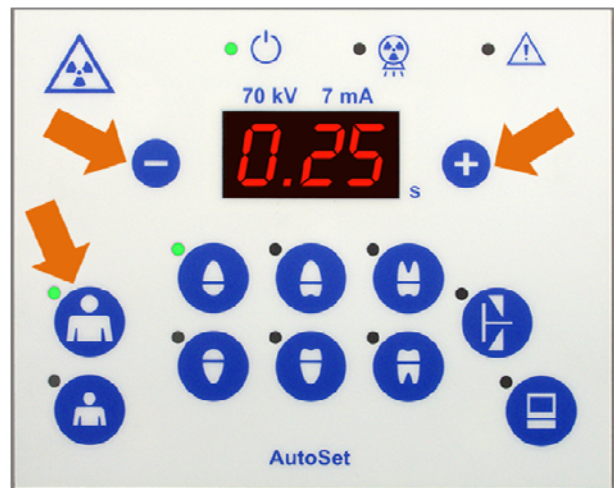
- a Enter this function by switching the system “on” while pressing at the same time the \oplus , the \ominus , and the ☒ keys.
- b Exit by switching the system off.



B Test of Control Panel.

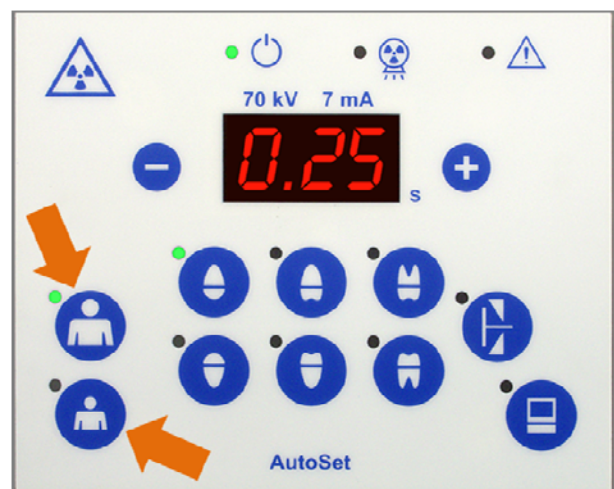
This function is intended to test lights, buttons, and segments of numerical display on the control panel.

- a Enter this function by switching the system “ON” while pressing at the same time the \oplus , the \ominus , and the adult ☒ keys.
- b By pressing the \oplus or \ominus keys all segments of the numerical display are scanned.
- c By pressing the X-ray pushbutton ☒ the “rAY” message is displayed.
- d By pressing each button on the panel, the corresponding lamp is turned “ON”; a second pressure would turn it “OFF”.
- e At the last button pressed the system exit this function.



WARNING: Do not press the X-ray pushbutton as last button twice; the second time the timer becomes active and radiation could be emitted.

C Firmware Version. This function returns the code of the version of firmware loaded.



5. MEASUREMENTS

All measurements to be done with the equipment supplied at nominal line voltage with specified line resistance (see section 2.1 at page 10). The tolerances on the measured values have to take into account the precision of the each measurement instrument. Measurements have to be done by trained personnel only to avoid the risk of electrical shock.

5.1 Line Voltage

The Line voltage can be measured using a Volt Meter for Alternate Current within the proper range. A service function can be activated on the AutoSet timer to display the current line voltage in V and frequency in Hz (see section 4.8 of this Manual).

5.2 Anode Voltage – kVp

The kVp level is the actual peak value of the Anode voltage which stabilizes once the preheating time of the filament has elapsed (in about 0.2 s) 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 BLD 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.

5.3 Anode Current – mA

WARNING. To prevent high voltage shock make sure the system is disconnected from the power supply when connections to the measurement points are performed. Electric discharge might occur in case of improper operation.

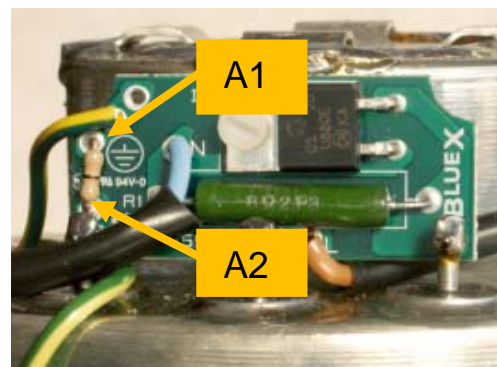


The Anode current in mA is the actual average value of the tube current which raises when the filament has warmed-up, after the pre-heating time has elapsed.

Remove the back cover of the tube-head, disconnect the jumper A1-A2 and replace it with a precision resistor of 1000 Ohm.

The anode current can be read with a DC voltmeter connected to points A1 and A2, with the 1 V corresponding to 1 mA.

After the measurement disconnect the 1000 Ohm resistor and put back the jumper.



5.4 Exposure Time

The actual exposure (loading) time is “determined as the time interval between the instant when the tube current first rises above the 25% of its maximum value and the instant when it finally falls below the same value”.

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 (SOT) of the tube-head assembly is therefore the sum of the filament pre-heating time (PHT) and of the requested exposure time (RET).

$$\text{SOT} = \text{PHT} + \text{RET}$$

The measurement of the exposure time can be done with kVp & Time meters with the ability to trigger at 75% of maximum kV level.

Exposure time can also be measured after having connected a precision resistor of 1000 Ohm between points A1 and A2 on the small circuit board on the back of the tube-head, by monitoring the voltage across it (tube current) with an oscilloscope, and counting the number of pulses in the time interval, as per above definition.

When the function to correct the effects of line fluctuations on the emitted X-ray dose is activated, the exposure time is corrected in order to assure dose consistency. When the actual line voltage is lower than the nominal line voltage, the actual exposure time is increased. Conversely, when the actual line voltage is higher than the nominal line voltage, the actual exposure time is decreased.

Do disable this correction function (dip switch number 1 of SW2 moved to OFF position) to verify exposure time accuracy.

5.5 Leakage Radiation

The value of leakage radiation of the X-ray tube assembly is measured at 1 m distance taking into account the energy provided in 1 hour. In case the measurement is performed at a distance different from 1 m, the value has to be properly corrected.

The applicable technique factors for IntraOs 70 are of 70 kV and 7 mA. The point of maximum leakage has to be considered, excluding the direction of the primary beam. The duty cycle factor as reported in sections 2.2, Tube Housing Assemblies, at page 10, has also to be taken into account for the computation of the actual dose rate.

In case for example a measure is done at 50 cm distance from the source with an exposure of 1 s, the following computations have to be performed:

- A duty cycle of 1/15 means maximum of 1 s exposure every 15 s, i.e. 240 s per hour.
- Dose at 100 cm is computed taking into account the inverse square law, i.e. at twice the distance the dose intensity is reduced to one quarter.

$$D_{1h100cm} = D_{1s50cm} * 240 * (50/100)^2 = D_{1s50cm} * 60$$

where: D_{1s50cm} is the dose measured at 50 cm with 1 s exposure and $D_{1h100cm}$ is the dose computed at 1 m distance for the energy of 1 hour.

5.6 Earth Resistance-

The measurement of the earth resistance to be done after having disconnected the system for the power supply line.

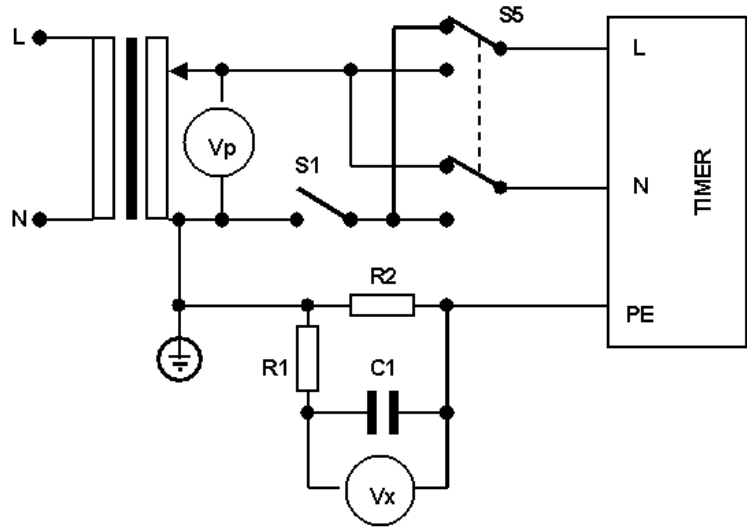
Using a voltage generator of not more than 6 V, 50/60 Hz, a current of 25 A is applied from 5 s to 10 s through the earth terminal in the connecting block of the timer to any metal part which can be in touch to the patient/operator (applied part).

The voltage drop is then measured and the earth resistance computed.

The system complies for values up to 0,1 Ω (extended to 0,2 Ω in case of supply cord like in the case of a mobile system).

5.7 Earth Leakage

Connect the Timer to the measuring circuit as shown in the figure ($R1=10\text{ k}\Omega \pm 5\%$, $R2=1\text{ k}\Omega \pm 1\%$, $C1=0,015\text{ }\mu\text{F} \pm 5\%$)



- A** Set the input supply voltage (V_p) equal to 110% of the nominal supply voltage.
- B** Connect a voltmeter (V_x with 1 M Ω input impedance) to the indicated points
- C** Switch the Timer “ON”
- D** Make two measures in Normal Conditions (NC with S1 “ON”)
 - S5 “ON”: live and neutral conductors in normal condition.
 - S5 “OFF”: swap of live and neutral conductors.
- E** Make two measures in Single Fault Condition (SFC with S1 “OFF”).
 - S5 “ON”: live and neutral conductors in normal condition.
 - S5 “OFF”: swap of live and neutral conductors.

Please note that 1V equals to 1mA.

Make sure values of leakage currents fall within the limits shown in the table below.

LIMIT OF EARTH LEAKAGE CURRENT		
Type Of Device	Normal Condition (S1 “ON”)	Single Fault Condition (S1 “OFF”).
X-ray Equipment permanently connected to line voltage	5 mA	10 mA
Mobile X-ray Equipment	2,5 mA	5 mA

6. SPARE PARTS

6.1 Tube-Head

93 202 01300: G120N 120 V without BLD

93 202 01700: G230N 230 V without BLD

List of Spare Parts – Figure TH		
Item	Description	Code
A	Rear and Front Cover	76 190 25110
B	Rectangular Beam Limiting Device	91 300 00040
C	Round Beam Limiting Device	91 300 00020
D	Side cap for coupling yoke	76 190 25120
E	Friction disk for coupling yoke	76 190 25450
F	Friction kit TH with 16 disk springs 10x3x0.5	76 500 30060
G	Coupling yoke DG	76 500 25245
H	Wave suppressor board	76 190 25600

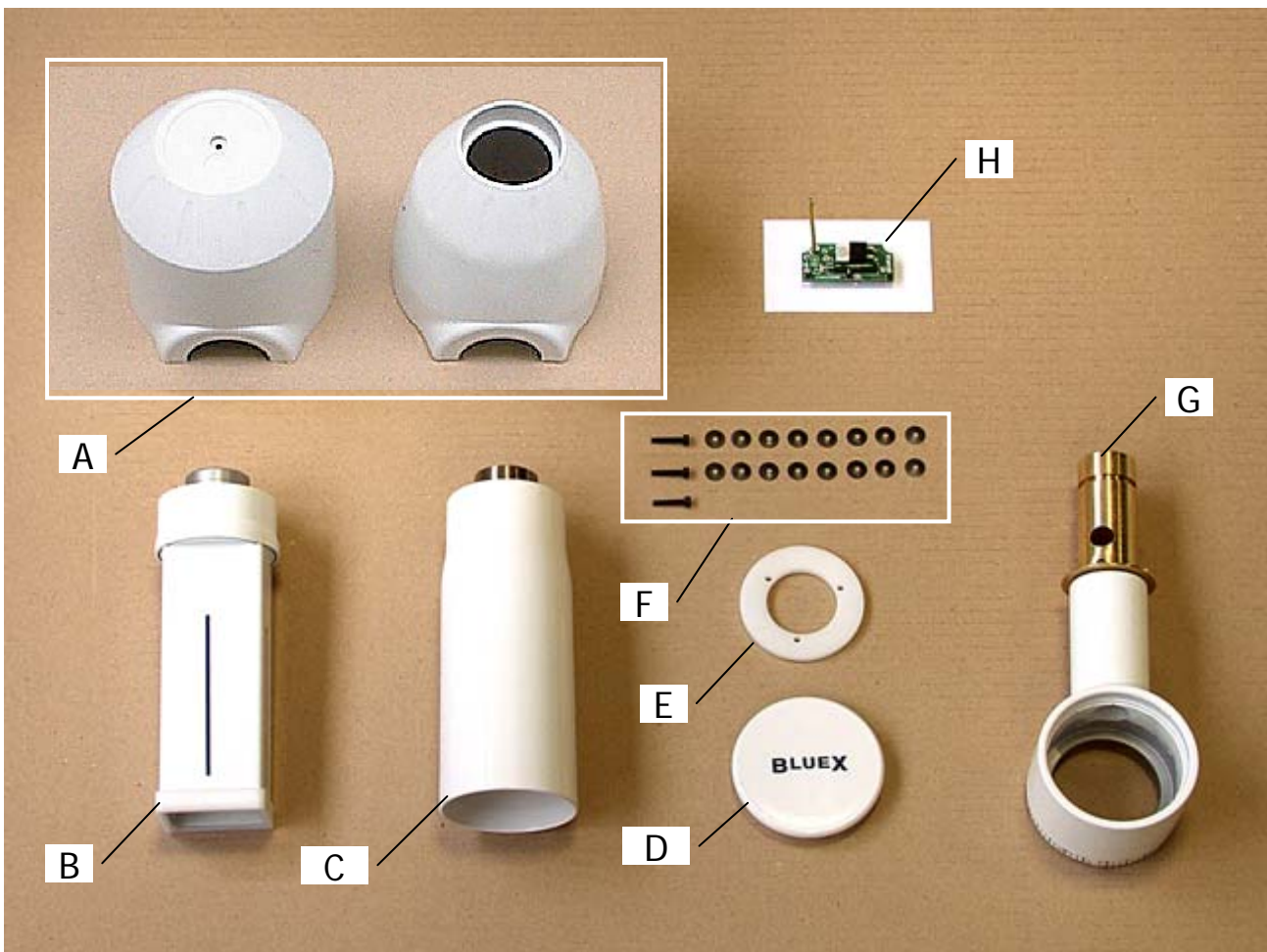


Figure TH

6.2 Scissor Arm

93 150 12010

List of Spare Parts - Figure FA		
Item	Description	Code
A	Ring Spacer D28 FA	76 190 25130
B	Set of 8 plastic covers FA	76 500 30080
C	Friction kit FA with 4 cup springs 20x10x0.8	76 500 30100
D	Handgrip pipe with O ring	76 500 30020
E	Retaining fork	76 500 30015
F	Power cable 3.15 m with end-stop tie	76 500 20030

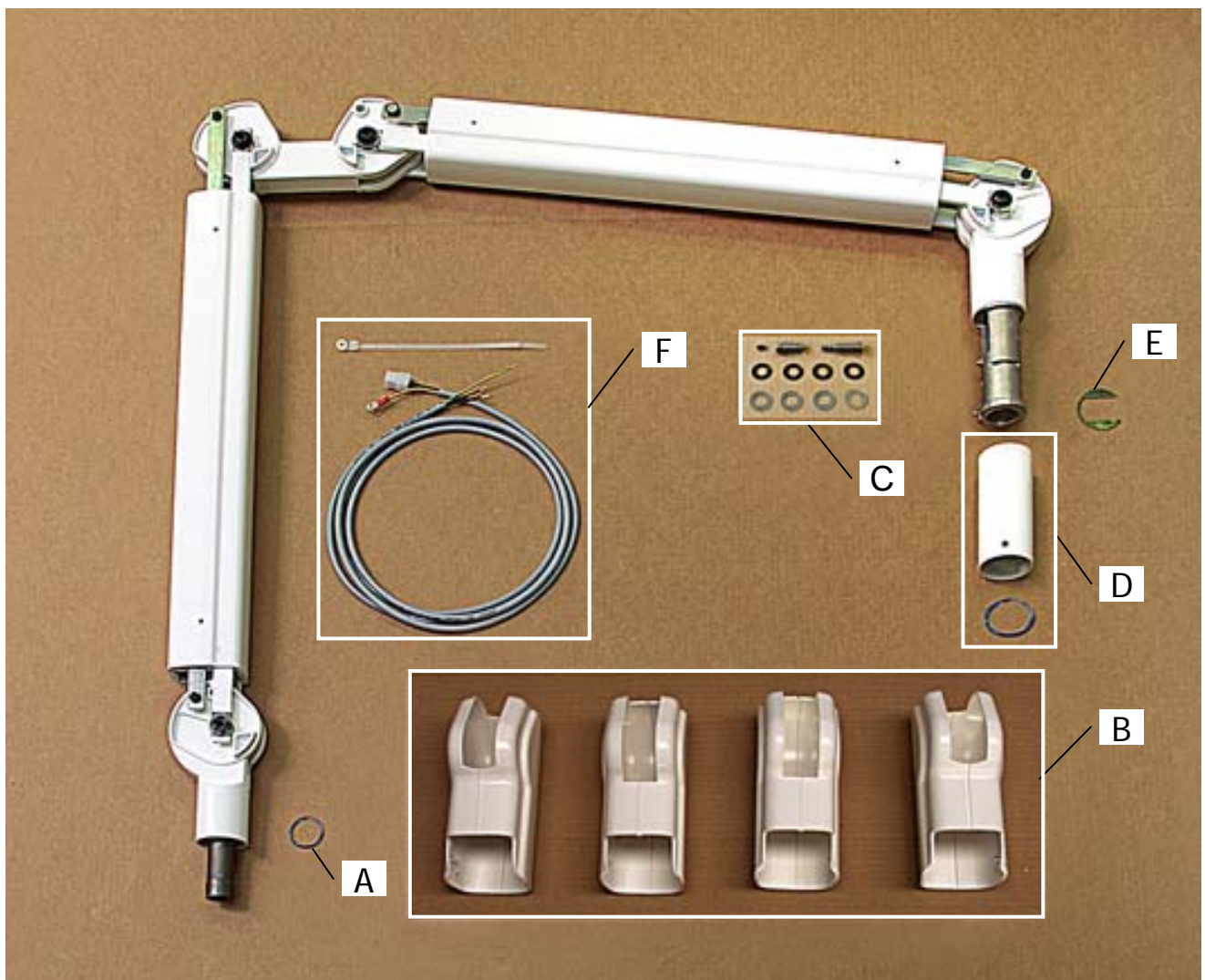


Figure FA

6.3 Support Arm

- 93 150 17100 – 30 cm
- 93 150 17200 – 60 cm
- 93 150 17300 – 80 cm

List of Spare Parts – Figure EA		
Item	Description	Code
A	End Stop Spacer EA with screw	76 500 30025
B	Large Ring Spacer D35	76 190 25470
C	Ground wire EA with screw	76 500 20050
D	Set of caps EA	76 500 30045
E	Friction kit EA/MB with 15 disk springs 10x5x0.4	76 500 30030

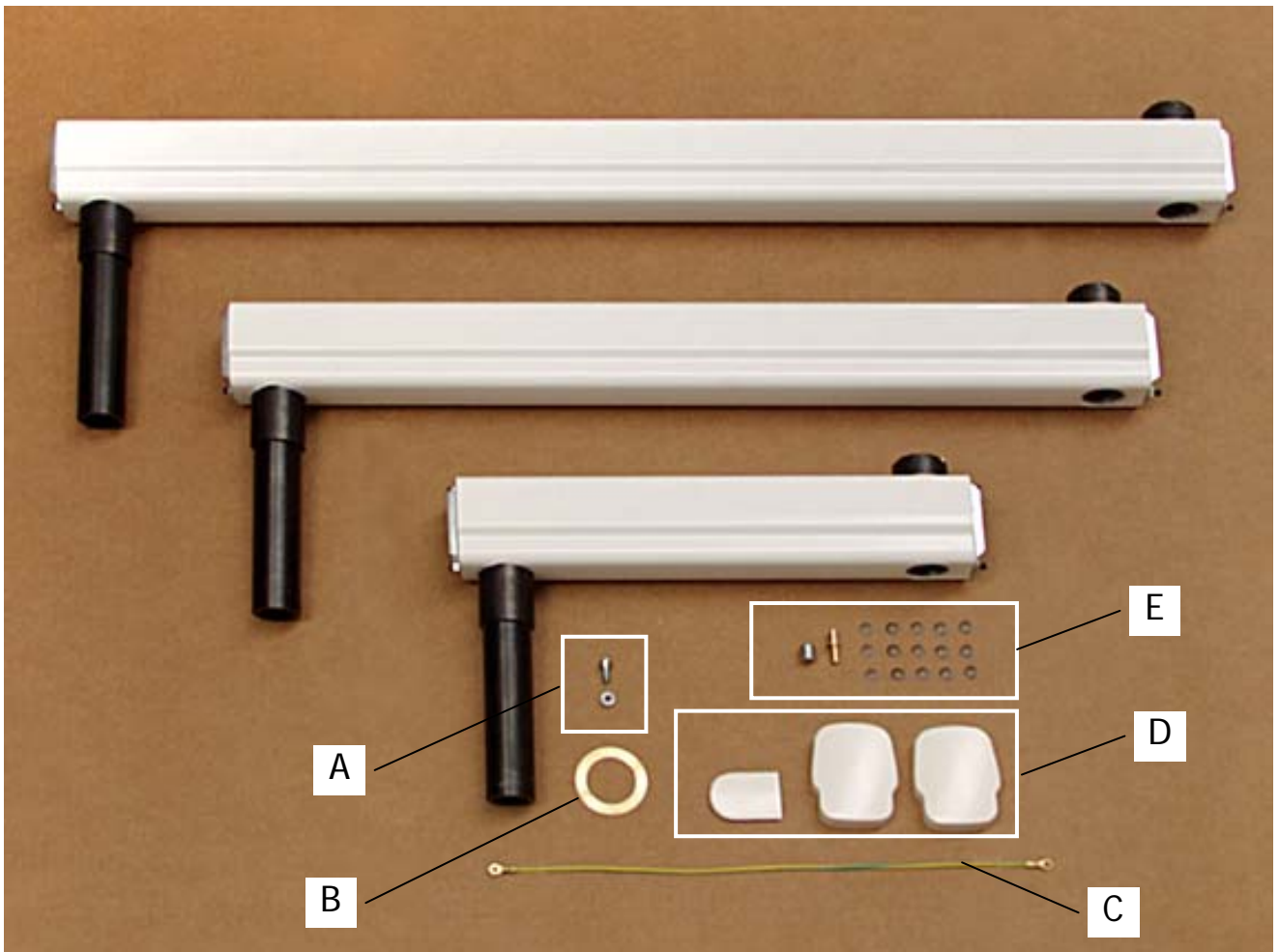


Figure EA

6.4 Wall Adaptor

93 100 11000

List of Spare Parts - Figure WS		
Item	Description	Code
A	Plastic Cover Wall Mount	76 190 25190
B	Logo Strip Blue X	76 190 25200
C	Friction kit WS with 21 cup springs 12.5x6x0.5	76 500 30040
D	Ground Wire WS	76 500 20015

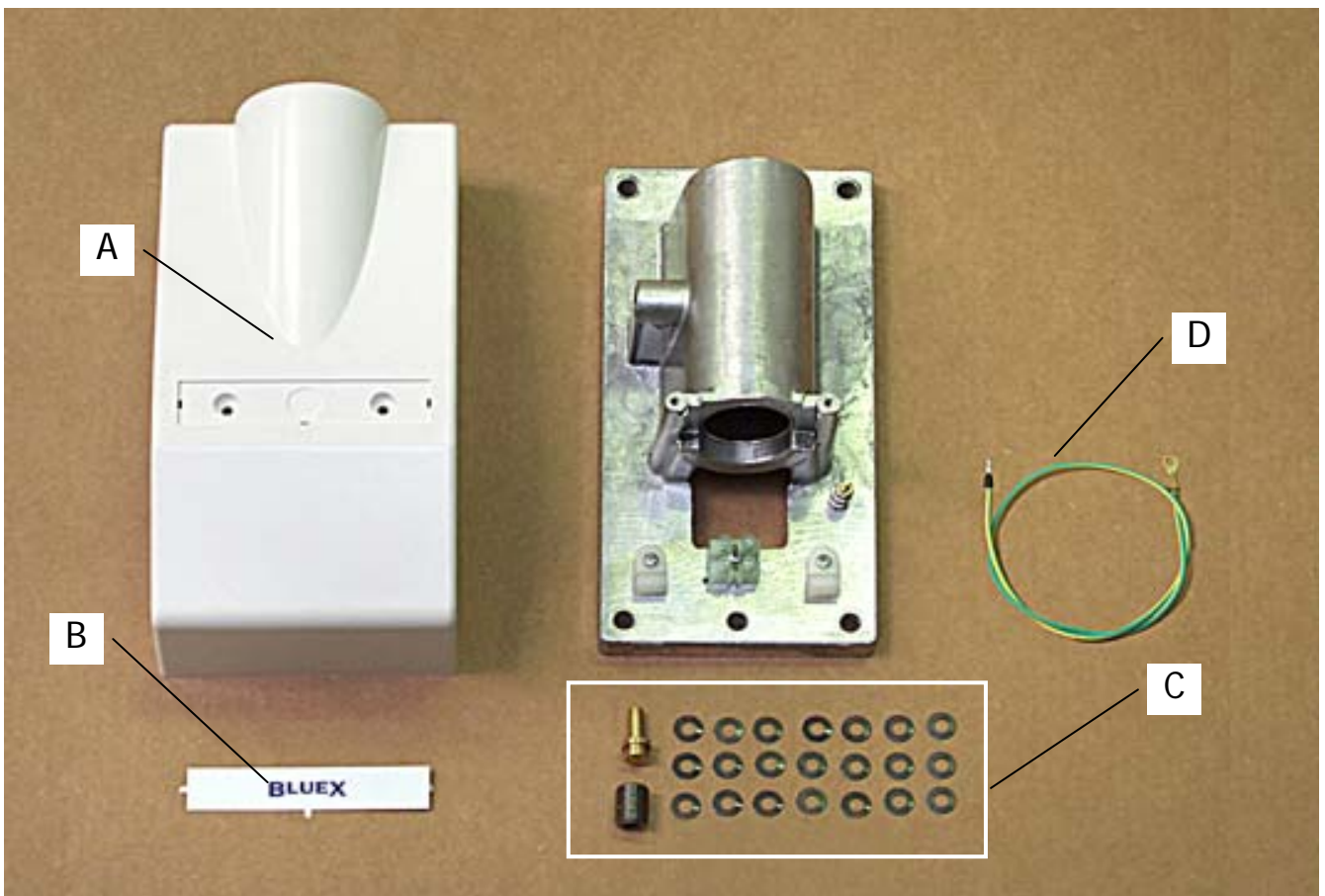


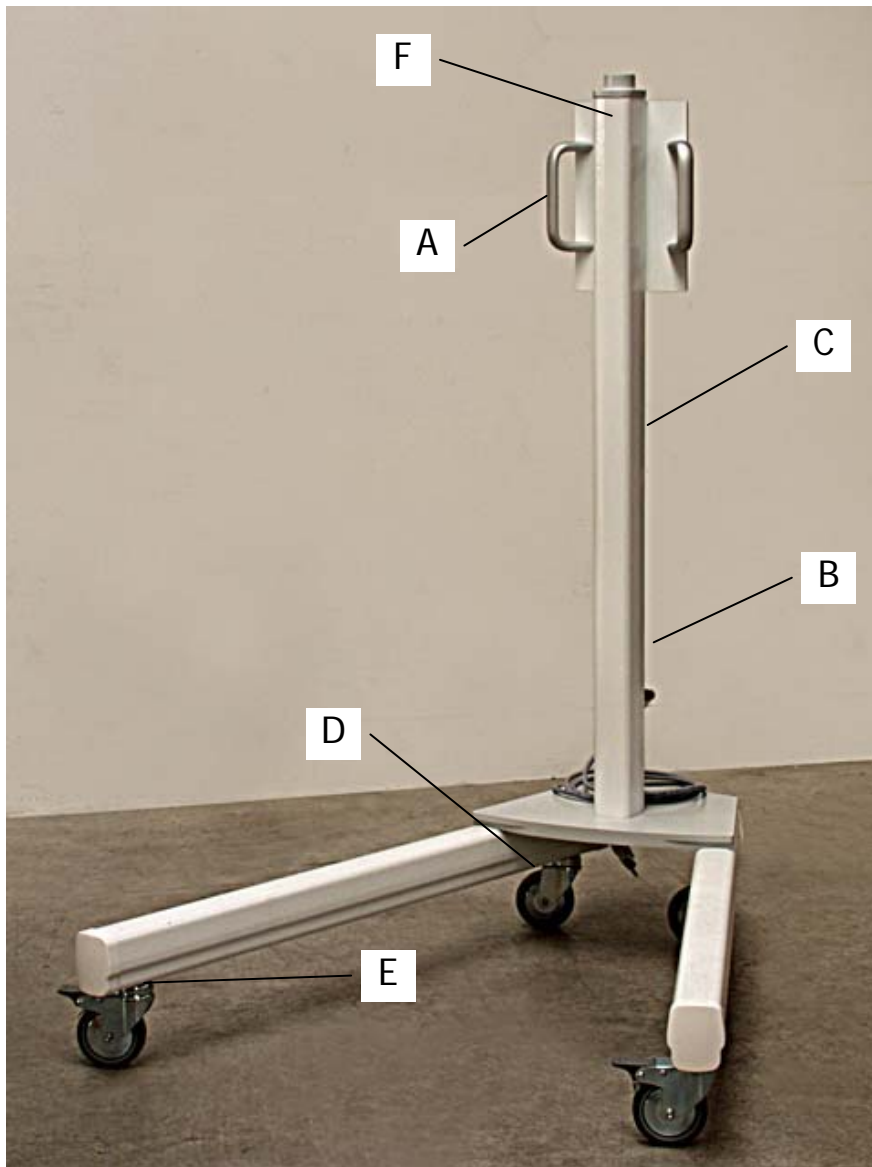
Figure WS

6.5 Mobile Stand

93 150 20080

93 150 20090

List of Spare Parts – Figure MB		
Item	Description	Code
A	Transport Handle (set of 2)	76 500 30055
B	Strain Relief	76 190 25300
C	Cable holder	76 500 30120
D	Wheel, spacer and adaptor(set of 2)	76 500 30065
E	Wheel with Brake, spacer and adaptor (set of 2)	76 500 30090
F	Friction kit EA/MB with 15 disk springs 10x5x0.4	76 500 30030

**Figure MB**

6.6 AutoSet Timer

93 300 60200: 115 V

93 300 60100: 230 V

List of Spare Parts – Figure TP		
Item	Description	Code
A	Front Cover	76 190 25220
B	Mounting Plate	76 190 25230
C	Mounting Columns	76 190 25310
D	230 V Power Control Board 230V AutoSet FW	76 190 25510
	115 V Power Control Board 115V AutoSet FW	76 190 25511
E	Keyboard Control Panel	76 190 25530
F	AutoSet Membrane	76 190 25550
G	Hand Switch Without Cable	76 190 25590
H	Coiled Cable	76 190 25580
I	Logo Strip IntraOs 70	76 190 25210
J1	230 V Fuse F1/F2 T5A 250V 5x20 (set of 10)	76 190 25640
	115 V Fuse F1/F2 T8A 250V 6.3X32 (set of 10)	76 190 25641
J2	Fuse F3/F4 T200 mA 250 V 5x20 (set of 10)	76 190 25630

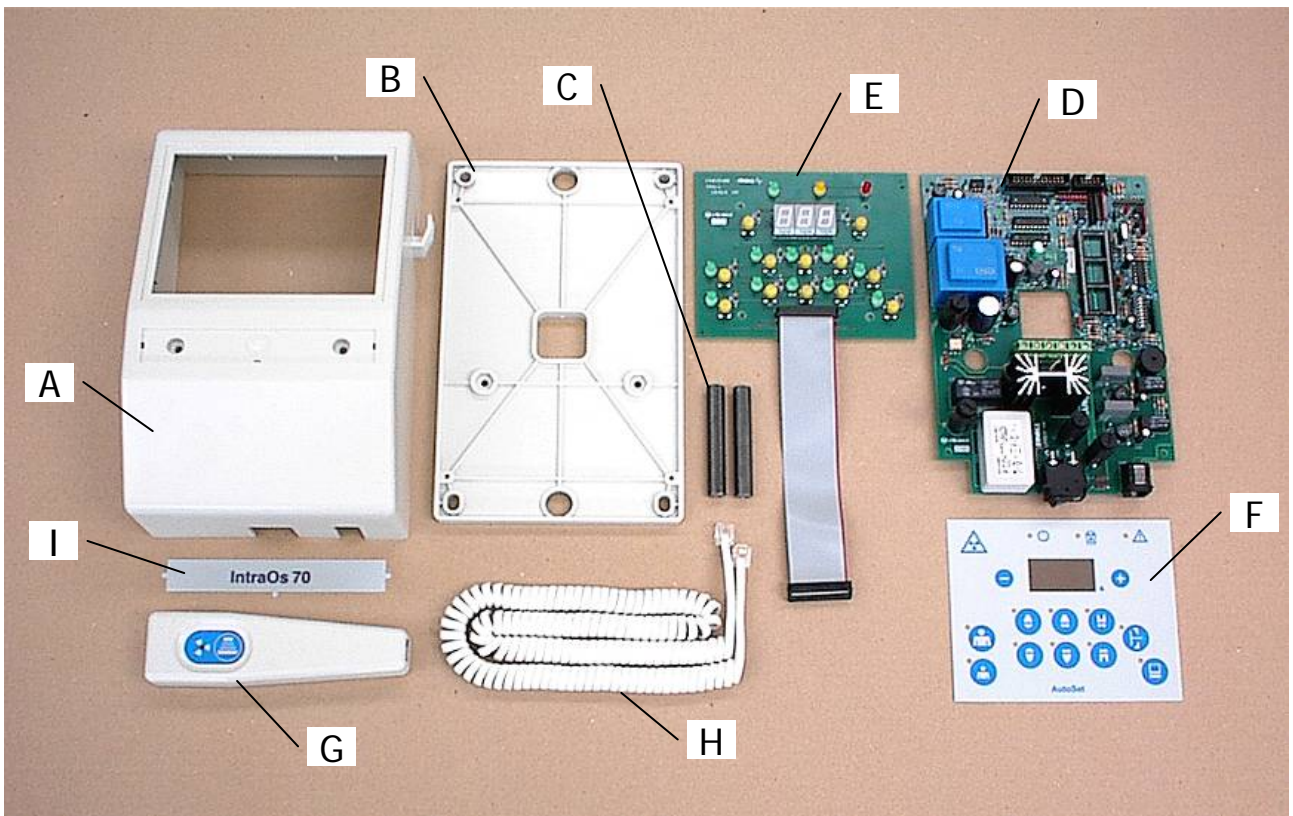


Figure AU



































Appendix A System Components

IntraOs 70 – Intraoral X-ray System

Article	Type Code
Wall Adaptor	93 100 11000
Support Arm 30 cm	93 150 17100
Support Arm 60 cm	93 150 17200
Support Arm 80 cm	93 150 17300
Scissor Arm	93 150 12010
Tube Head 120 V G120N	93 202 01300
Tube Head 230V G230N	93 202 01700
Round BLD	91 300 00020
Rectangular BLD	91 300 00040
AutoSet Timer 115 VAC	93 300 60200
AutoSet Timer 230 VAC	93 300 60100
Mobile Stand	93 150 20080
Mobile Stand UL/CSA	93 150 20090
Wall Plate 16"	86 100 11500



Appendix B Icons

	IEC Type B Equipment		Compliance to European Community Requirements
	X-ray On Irradiation		Compliance to Canadian and US Standards
	Examine Annexed Documentation		Line voltage supply On - System Ready
	Increase Exposure Time (one step)		Off (Disconnected from Line voltage Supply)
	Decrease Exposure Time (one step)		On (Connected to Line voltage Supply)
	Child – Small Patient		Alternate Current
	Adult – Large patient		Fuse
	Upper Incisor		Protective Earth
	Upper Canine/Premolar		Neutral Point (for equipment permanent connected to line)
	Upper Molar		Live Point (for equipment permanent connected to line)
	Lower Incisor		Inherent Filtration
	Lower Canine/Premolar		Focal Spot
	Lower Molar		Fragile, Handle With Care
	Bite Wing - Interproximal		Fear of Humidity
	Digital Receptor		Up Do Not Overturn
	Radiography Push Button		Stacking Limit
	Ionizing Radiation		Separate Collection, Do Not Dispose

Appendix C Exposure Table






IntraOs 70 - 70 kVp, 7 mA - Exposure Times in s												
Focus-Film Distance 23 cm						D Film			E Film		Digital	Small Patient
				D Film				E Film		Digital		
				D Film		E Film		Digital				Large Patient
	3,20	2,50	2,00	2,60	1,25	1,00	0,80	0,64	0,50	0,40	0,32	
	2,50	2,00	2,60	1,25	1,00	0,80	0,64	0,50	0,40	0,32	0,25	
	2,00	2,60	1,25	1,00	0,80	0,64	0,50	0,40	0,32	0,25	0,20	Upper Molar
	1,60	1,25	1,00	0,80	0,64	0,50	0,40	0,32	0,25	0,20	0,16	Upper Premolar /Canine
Lower Molar	1,25	1,00	0,80	0,64	0,50	0,40	0,32	0,25	0,20	0,16	0,12	Bite Wing
Lower Premolar /Canine	1,00	0,80	0,64	0,50	0,40	0,32	0,25	0,20	0,16	0,12	0,10	Upper Incisor
Lower Incisor	0,80	0,64	0,50	0,40	0,32	0,25	0,20	0,16	0,12	0,10	0,08	
	0,64	0,50	0,40	0,32	0,25	0,20	0,16	0,12	0,10	0,08	0,06	
Focus-Film Distance 33 cm			D Film			E Film		Digital				Small Patient
		D Film			E Film		Digital					
	D Film			E Film		Digital						Large Patient

Appendix D Alarm Conditions


AutoSet Timer Alarm Conditions				
Code	Fault /Error	Signal	Action	Reset
A 01	X-ray requested during cool-down period	Green lamp (System Ready) flashing	System inhibited	By acknowledgement on the panel or when system cooled down
A 02	Line voltage below lower limit	Green lamp (System Ready) and red lamp (Alarm) flashing	System inhibited	Automatically when line voltage back in range
A 03	Line voltage above upper limit	Green lamp (System Ready) and red lamp (Alarm) flashing	System inhibited	Automatically when line voltage back in range
A 04	Computed exposure factor lower than minimum	Green lamp (System Ready) and red lamp (Alarm) flashing	Minimum exposure factor forced	By acknowledgement on the panel
A 05	Corrected exposure factor greater than maximum	Green lamp (System Ready) and red lamp (Alarm) flashing	Maximum exposure factor forced	By acknowledgement on the panel
A 06	Line Frequency Detection Failure	System Ready (green) lamp and Alarm (red) lamp flashing	System inhibited	By switching system off and on again
A 07	Exposure push button pressed at power on	Red lamp (Alarm) flashing	Exposure inhibited	By acknowledgement on the panel
A 08	Exposure stopped by the operator	Red lamp (Alarm) flashing	System inhibited	By acknowledgement on the panel or after 1 m
A 99	Exposure stopped by the back-up timer	Red lamp (Alarm) switched on	System inhibited	By switching system off and on again
A 10	Back-up relay failure	Red lamp (Alarm) switched on	System inhibited	By switching system off and on again
A 11	Power switching device failure	Red lamp (Alarm) switched on	System inhibited	By switching system off and on again
A12	Line dips during exposure	Red lamp (Alarm) switched on	Exposure inhibited	By acknowledgement on the panel

Appendix E Identification Labels

BLUEX
IntraOs 70 70 kVp 7 mA

A037400 0051

230 V ~ 50/60 Hz 4 A TUBE OCX/70-G
 2.5 A I/70 ■ 0.8 CEI BOLOGNA ITALY

TYPE 9320201700 SN 2412TQ0001
 MANUFACTURED DECEMBER 2008

BLUE X IMAGING SRL
 VIA IDIOMI 1/8-33
 ASSAGO ITALY

BLUEX
IntraOs 70 70 kVp 7 mA







0051 C US

120 V ~ 50/60 Hz 6 A TUBE OCX/70-G
 2.5 A I/70 ■ 0.8 CEI BOLOGNA ITALY

TYPE 9320201300 SN 2412TR0001
 MANUFACTURED DECEMBER 2008
 COMPLIES WITH DHHS PERFORMANCE
 STANDARD 21 CFR SUBCHAPTER J
 BLUE X IMAGING SRL
 VIA IDIOMI 1/8-33
 ASSAGO ITALY


BLUE X IMAGING
VIA IDIOMI 1/8-33
ASSAGO ITALY

Scissor Arm
Type 9315012010


 SN 2412GM0001




BLUE X IMAGING
VIA IDIOMI 1/8-33
ASSAGO ITALY

Support Arm 60
TYPE 9315017200
SIRONA 62 80 239
SN 2412600001









BLUE X IMAGING
VIA IDIOMI 1/8-33
ASSAGO ITALY

Wall Adaptor
Type 9310011000


 SN 2412WS00001








WARNING:
 THIS X-RAY UNIT MAY BE DANGEROUS TO THE PATIENT AND OPERATOR UNLESS SAFE EXPOSURE FACTORS AND OPERATING INSTRUCTIONS ARE OBSERVED. ELECTRICAL SHOCK HAZARD – DO NOT REMOVE PANELS. RISK OF EXPLOSION – DO NOT USE IN PRESENCE OF FLAMMABLE ANESTHETICS. FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING FUSE.

COMPLIES WITH DHHS PERFORMANCE STANDARD 21 CFR SUBCHAPTER J




AutoSet Timer
 0.06 – 3.2 s
 MANUFACTURED DECEMBER 2008
 Type 9330060200

 SN 2402AB0199

 110-120 V ~ 50/60 Hz
 Fuse T 6.3 A

BLUE X IMAGING SRL
VIA IDIOMI 1/8-33
ASSAGO ITALY

BLUE X IMAGING SRL
VIA IDIOMI 1/8-33
ASSAGO ITALY




AutoSet Timer
 0.06 – 3.2 s
 Type 9330060100

 SN 2402AA0199

 220-240 V ~ 50/60 Hz
 Fuse T 4A

Manufactured by
Blue X Imaging S.r.l.
Assago Italy

Round BLD
Type 9130000020


 SN 2412BR0012


SSD 21 cm Beam Size 6 cm
 COMPLIES WITH DHHS
 PERFORMANCE STANDARD
 21 SUBCHAPTER J
 MANUFACTURED DECEMBER 2007

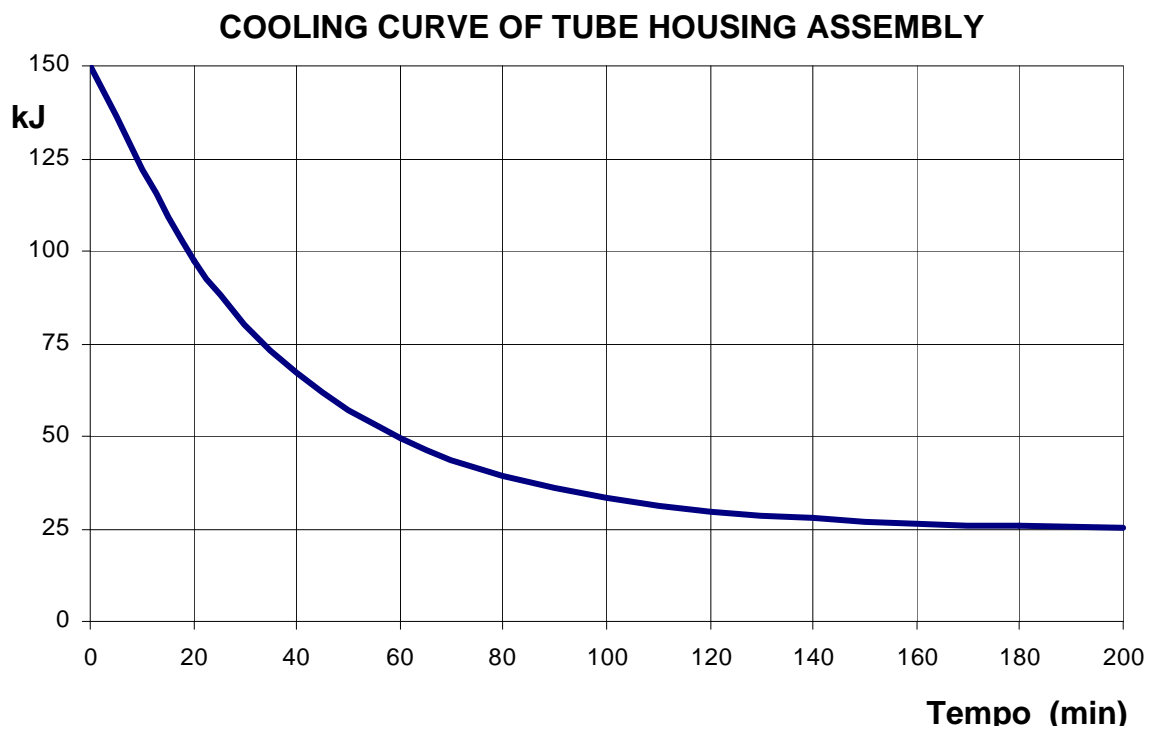
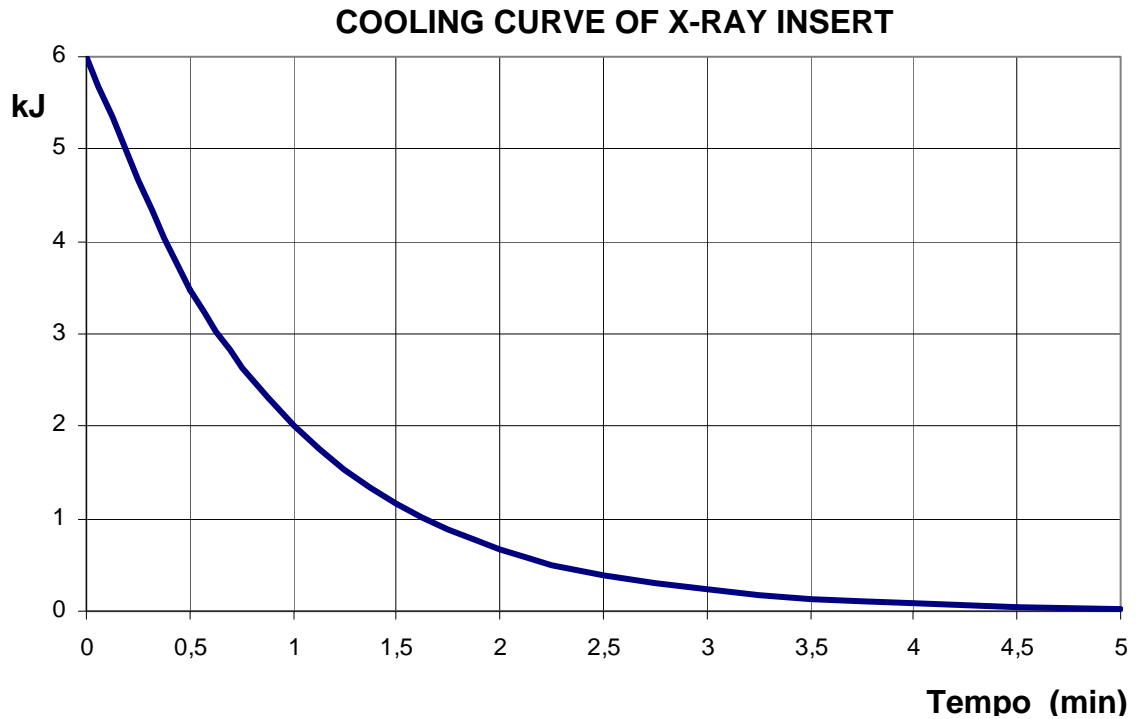
BLUE X IMAGING
VIA IDIOMI 1/8-33
ASSAGO ITALY

Mobile Stand
TYPE 9315020080
SIRONA 62 80 312
SN 2310GB0022



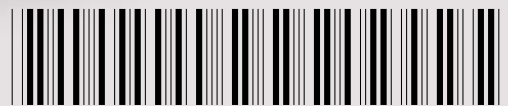
SECURE ARM FOR TRANSPORT
 CHIUDERE PER TRASPORTO
 FERMER POUR TRANSPORT
 CÍERRESE PARA TRANSPORTE
 ARM ZUM TRANSPORT SICHERN

Appendix F Cooling Curves





IntraOs 70
X-ray Equipment
Service & Installation Manual
English Edition
Version 5.03



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