PLANMECA

Prostyle Intra

TECHNICAL MANUAL

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En

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1 GENERAL & TECHNICAL DATA

1.1 Warnings and cautions

WARNING

THE FOLLOWING WARNINGS, CAUTIONS AND NOTES MUST ALWAYS BE CONSIDERED WHILE SERVICING THE UNIT, IN ORDER TO AVOID EITHER PERSONAL INJURY OR DAMAGE TO THE UNIT.

CAUTION

RADIATION SAFETY RULES
Some procedures described in this manual produces X-ray radiation. Always follow the rules for radiation protection.
Never attempt to open the tube head. It does not contain any serviceable parts, and radiation safety could not be guaranteed any more.

CAUTION

ELECTRICAL SAFETY RULES
The unit contains hazardous voltages. While servicing internal parts, always turn off externally the power to the unit, and wait for 2 minutes before touching any electrical parts.
Always replace the fuses with ones of the same type and rating. Otherwise patient, operator or equipment safety cannot be guaranteed.
The circuit boards can be damaged due to static discharges and require careful handling.

CAUTION

GENERAL SAFETY RULES
The unit must be serviced only by qualified personnel, trained by PLANMECA. Repairs and parts replaced by unqualified personnel carry no warranty.
Periodical maintenance as described in this manual must be performed on a regular basis, to ensure the safety and image quality of the unit.
Some procedures described in the unit could be dangerous, if not followed as stated.

1.2 Manual versions

Planmeca pursues a policy of continual product development. Although every effort is made to produce up-to-date product documentation this publication should not be regarded as an infallible guide to current specifications. We reserve the right to make changes without prior notice.

NOTE ***This manual is only valid for the software versions from 1.20 and later.***

1.3 Technical specifications

Generator	Constant potential, microprocessor controlled, operating frequency 66 kHz
X-ray tube	Toshiba D-0711SB
Focal spot size	■ 0.7 mm according to IEC 336
Cone diameter	60 mm (2.36 in.) Rectangular 35 x 45 mm (1.38 x 1.77 in.)
Max. symmetrical radiation field	ø 60 mm at SSD 200 mm ø 60 mm at SSD 300 mm according to IEC 806
Total filtration	min. 2 mm Al equivalent at 70 kV according to IEC 522
Inherent filtration	1 mm Al equivalent at 70 kV according to IEC 522
Anode voltage	50, 52, 55, 57, 60, 63, 66, 70 kV, ±2 kV
Anode current	8 mA
Target angle	16°
Exposure times	0.01-3.20 sec., 23 steps
Reference current time product	8 mAs at 70 kV, 8 mA, 1 sec.
Lowest current time product	0.08 mAs at 8 mA, 0.01 sec.
Max. nominal anode voltage	70 kV
Max. electrical output	560 W at 70 kV, 8 mA
Electrical output at 0.1 sec.	560 W at 70 kV, 8 mA
Max. loading energy	1800 mAs/h at 70 kV
SSD (Source-Skin Distance) Standard/Long Long with rectangular collimator	 200 mm (8 in.)/300 mm (12 in.) 306 mm (12.04 in.)
Mains voltage	100 V~/110-115 V~/220-240 V~ ±10%
Mains frequency	50/60 Hz ±10%
Fusing	8 AT at 220-240V~15 AT at 100 V~/110-115 V~
Duty cycle	1:15, automatic control
Electrical classification	Class I Type B

Mechanical data

Weight	total 23 kg (51 lbs) tube head 4.2 kg (9.3 lbs) with standard cone 4.5 kg (10 lbs) with long cone
Color	RAL 9016

Environmental requirements

Ambient temperature	operating +5°C - +40°C storage -10°C - +50°C
Humidity	25% - 75%

Original manufacturer

PLANMECA Oy, Asentajankatu 6, FIN-00810, Helsinki, FINLAND
phone: +358-9-7590 5500, fax: +358-9-7590 5555

1.4 User's statement for Prostyle Intra

Radiation leakage technique factors

The maximum rated peak tube potential is 70 kV and the maximum rated continuous tube current is 0.53 mA for the maximum rated peak tube potential.

Minimum filtration

The radiation port contains an added 1.0 mm aluminium filtration. The measured half-value is 0.50 - 0.55 at 70 kV. The measured value corresponds to an aluminium equivalent of 2.0 mm.

Rated line voltage

100, 110-117, 220-240 V~ ±10%. Line voltage regulation 10%.

Maximum line current

4.5 A at 230 V~, 9.0 A at 115 V~

Technique factors that constitute the maximum line current condition

70 kV, 8 mA

Generator rating and duty cycle

1.0 kW, duty cycle 1:15. The wait period is controlled automatically by calculating it according to the formula tw = 15 x texp.

Maximum deviation of peak tube potential from indicated value

± 2.0 kV

Maximum deviation of tube current from indicated value

±10%

Maximum deviation of exposure time from indicated value

±10%

DEFINITION OF MEASUREMENT CRITERIA

Exposure time

The beginning and end points of the exposure time are defined at 70% of the peak radiation waveform measured with a calibrated x-ray monitor.

Peak tube potential

Is defined as the high voltage mean value measured with a calibrated non-invasive kVp meter.

Tube current

Is defined using the voltage over the feedback resistor measured with a calibrated multimeter. The mA value is calculated by dividing the voltage by the resistance value.

The nominal x-ray voltage together with the highest x-ray tube current obtainable from the high-voltage generator when operated at it's highest x-ray tube voltage

70 kV, 8 mA

The nominal x-ray tube current when operated at the highest x-ray tube voltage

8 mA, 70 kV

The x-ray tube voltage and tube current which result in the highest electric output power

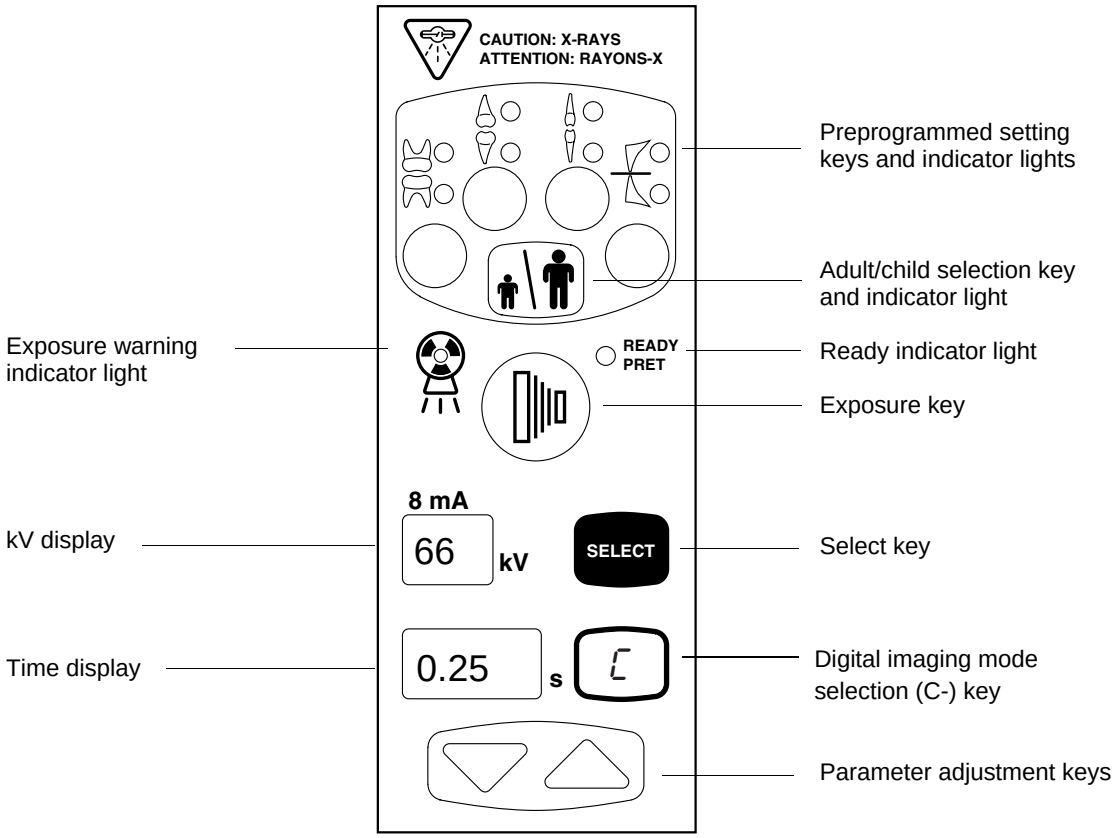
70 kV, 8 mA

The nominal electric power for a load time of 0.1 sec and at the nominal x-ray tube voltage

1,0 kW at 70 kV, 8 mA

2 SERVICE MODE

2.1 Control panel



2.2 How to enter/exit the service mode

Press and hold down the select key for 6 seconds.

Press and hold down the C-key for 6 seconds.

To exit from the service mode

Press the C-key briefly.

2.3 X-ray tube filament preheating voltage calibration

Enter the service mode.

Press and hold down the adult/child mode selection key for 3 seconds or until the indicator light starts to blink. The indicator lights will start to blink indicating that you are in the preheating voltage calibration mode.

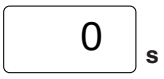
Move as far away from the x-ray tube as the length of the cable from the control panel permits.

Press and hold the exposure key on the control panel until two exposures are performed.

2.4 kV range selection

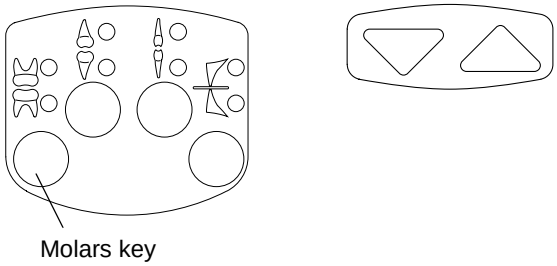
Enter the service mode.

Press the parameter adjustment up key until the parameter number 14 appears on the kV display.



The code of the kV range (0, 1, 2, 3 or 4) is shown on the time display. The kV ranges are: 0 = 50-70 kV, 1 = 55-70 kV, 2 = 60-70 kV, 3 = 66-70 kV and 4 = 70 kV.

Press and hold down the preprogrammed setting molar key for 6 seconds. The kV range code starts to blink, and can now be changed with the parameter adjustment keys.



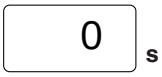
Accept the new kV range by pressing the molars key.

Press the C-key briefly to exit the service mode.

2.5 Operation of the preporgrammed settings keys (kV hold)

Enter the service mode.

Press the parameter adjustment up key until the parameter number 15 appears on the kV display.

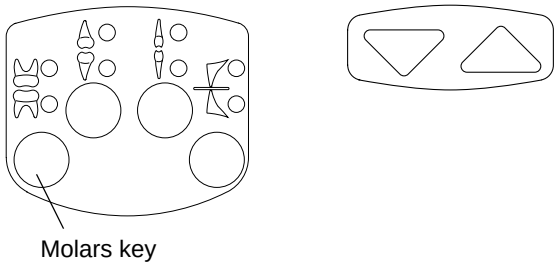


The number indicating the operation of preprogrammed settings keys (0 or 1) is shown on the time display.

0: Normal operation (factory setting). The preprogrammed settings keys operate as described in the Prostyle Intra user's manual.

1: kV hold. The selection of a preprogrammed setting does not affect the prior manually inserted kV value, but the exposure time is recalculated to achieve constant optical density on the film. In the case the kV value is now manually altered, the exposure time will also be changed automatically. If the exposure time is manually altered, the unit will return into manual mode. At any time, the preprogrammed setting for both the kV value and exposure time for any tooth position is called by selecting the preprogrammed setting and pressing the child mode selection key twice.

Press and hold down the preprogrammed setting molar key for 6 seconds. The number starts to blink, and can now be changed with the parameter adjustment keys.



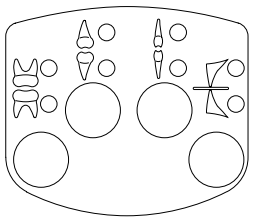
Accept the new setting by pressing the molars key.

Press the C-key briefly to exit the service mode.

3 RECALLING THE FACTORY PREPROGRAMMED EXPOSURE VALUES

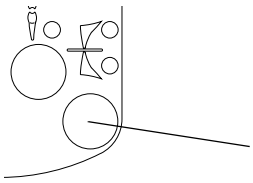
The factory preprogrammed exposure values are in the Prostyle Intra user's manual, section 9 "EXPOSURE VALUES".

Press and hold down any of the preprogrammed setting keys when switching the unit on. The error code E.29 will appear on the time display.



E.29 **s**

Do not clear the error code by pressing the select key, but press the right-hand preprogrammed setting key for 6 seconds. The factory preprogrammed values and density value 0 will be stored into memory.



4 TROUBLESHOOTING

The control panel displays do not come on and the indicator light of generator box is not on

Problems in mains voltage, or a fuse is blown.

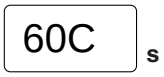
Check the mains voltage. Check the mains cable. Check and replace, if necessary, the fuses located on the lower left side of the generator box. Open the generator box and check and replace, if necessary, the generator fuse F2. Replace the generator. (Perform the checks and parts replacements in this order).

The control panel displays do not come on and the indicator light of generator box is on

Control panel power failure, or the control panel is defective. The control panel operates with 12 V produced on the generator low voltage supply.

Check the control panel cable and the telephone cable. Replace the control panel. (Perform the checks and parts replacements in this order).

Temperature of the tube head too high



If the temperature of the tube head exceeds 60 °C, the temperature will appear on the time display. The control panel does not operate. Wait until the temperature drops.

5 ERROR MESSAGES

E.11 s The error code is displayed on the time display.

SELECT Press the select key to clear the error from the display.

5.1 Error message shortform table

ERROR CODE	ERROR MESSAGE EXPLANATION
E.00	Exposure key was released too early during the exposure.
E.10	X-ray tube Anode voltage (kV) overshoot.
E.11	X-ray tube Anode voltage (kV) dropped suddenly.
E.12	X-ray tube cathode filament preheating voltages are not calibrated.
E.13	Filament preheating voltage calibration failed.
E.29	Membrane keyboard key short-circuited/pressed during the self test or faulty display board.
E.30	kV value does not reach or it exceeds the given value (difference more than 5%).
E.31	X-ray tube Anode current (mA) missing, or not in specified limits.
E.33	X-ray tube Filament voltage (V) missing, or outside the range (too low or too high).
E.34	X-ray tube Anode voltage (kV) missing, or below the specified limit.
E.36	Too long exposure.
E.37	kV feedback signal open circuit or short circuit.
E.38	mA feedback signal open circuit or short circuit.
E.50	Tube head temperature sensor short circuit.
E.51	Tube head temperature sensor open circuit.
E.52	Filament voltage feedback not in specified limits
E.57	Exposure key pressed during self test.
E.60	± 15VDC voltage is out of limits
E.61	Communication error between control panel and tube head CPU.
E.71	FLASH memory check-sum error (tube head CPU).
E.81	EEPROM memory defective (tube head CPU).
E.83	Config register error (tube head CPU).

5.2 Detailed error message explanations

E.00 Exposure key was released too early during exposure

The most probable cause (if the key really was pressed firmly during the whole exposure) is faulty control panel or faulty separate exposure switch.

Replace the control panel or the separate exposure switch. Check the control panel cable, telephone cable and the arm cable.

E.10 X-ray tube anode voltage (kV) overshoot

This condition is monitored by the watch-dog circuit on the tube head PCB during the whole exposure and if the anode voltage rises above 95 kV the exposure is immediately aborted and this error indicated. A knocking sound may be heard from the tube head at the same time. This kind of arcing can occur now and then without any special reason, and should be considered a normal phenomenon. If however the occurrence frequency becomes too high, it could be an indication of a degrading tube head.

If this error occurs constantly it is probably caused by a faulty tube head or tube head PCB or generator PCB (replace in this order). The possible reason is also faulty feedback cable (9 pole) in the tube head.

E.11 X-ray tube anode voltage (kV) dropped suddenly

The x-ray tube voltage suddenly drops, and a knocking sound is heard from the tube head at the same time. The exposure is aborted and this error indicated. This phenomenon should be considered quite normal if it doesn't occur frequently. If the generator is damaged during the exposure, or the arm/extension cable is broken, this error is indicated and during next exposure the error E.30 occurs.

If this error occurs constantly it is probably caused by a faulty tube head or tube head PCB or generator PCB (replace in this order). The possible reason is also faulty feedback cable in the tube head.

E.12 X-ray tube cathode filament preheating voltages are not calibrated

The tube head PCB has been replaced, but the X-ray tube cathode filament preheating voltages are not calibrated.

See paragraph 2.3 "X-ray tube filament preheating voltage calibration" on page 6 for details how to perform the calibration.

E.13 Filament preheating voltage calibration failed

During preheat calibration the filament voltage is measured to be in specified limits. The filament circuit in the tube head or in the tube head PCB is faulty or the tube head is faulty.

Perform the calibration procedure again. If it fails, replace the tube head or tube head PCB (in this order). The possible reason is also faulty feedback cable in the tube head.

E.29 Control panel key short-circuited/pressed during the self test

This error can occur only during the self-test. During the self test the unit checks that all keys are open (normal state if not pressed). If a key is found to be in short circuit, this error is displayed. Because the control panel keys are arranged in a matrix, one key's short could cause the whole keyboard to operate erroneously, therefore this check is important.

Replace the control panel.

The factory predetermined settings are recalled and the density value is set to zero by pressing any of the keys during the self test. The error code E.29 appears on the time display, after which the right-hand preprogrammed setting key must be pressed and held down for 6 seconds. See section 3 "RECALLING THE FACTORY PREPROGRAMMED EXPOSURE VALUES" on page 8.

E.30 kV value does not reach or it exceeds the given value (difference more than 5%)

The tube voltage is sampled periodically (by the tube head CPU) and if the actual measured kV-value differs more than ± 3 kV from the specified value this error is displayed. The tube head, tube head PCB, generator PCB or arm/extension cable signals HV1, HV2 or KVC (see wiring diagram) can be faulty. See also error E.11 and E.34.

Check the incoming mains voltage during the exposure. Check the arm/extension cable and the tube head feedback cable. Replace the generator PCB, tube head PCB or tube head (replace in this order).

E.31 X-ray tube anode current (mA) missing, or not in specified limits

The tube current is sampled periodically (by the tube head CPU) and if the actual measured mA-value differs more that ± 2 mA from the specified value this error is displayed. The tube head, tube head PCB or tube head feedback cable can be faulty.

Proceed with the filament definition, see paragraph 2.3 “X-ray tube filament preheating voltage calibration” on page 6 for details. If this does not help and the error occurs constantly check the tube head feedback cable, replace the tube head PCB, or tube head (in this order).

E.33 X-ray tube filament voltage (V) missing, or outside the range (too low or too high)

The tube filament voltage is sampled periodically (by the tube head CPU) and if the actual measured filament voltage is not in the specified limits (1.0 - 4.5 V) then this error is displayed. The filament circuit in the tube head or on the tube head PCB can be faulty.

Check the tube head feedback cable. Replace the tube head PCB or the tube head (in this order).

E.34 X-ray tube anode voltage (kV) missing, or below the specified limit

This error occurs in the beginning of the exposure, when the tube anode voltage does not rise. The tube head, tube head PCB, generator PCB or arm/extension cable signals HV1, HV2 or KVC (see wiring diagram) can be faulty. See also error E.11 and E.30.

Check the incoming mains voltage during the exposure. Check the arm/extension cable and the tube head feedback cable. Replace the generator PCB, tube head PCB or tube head (replace in this order).

E.36 Too long exposure

The control panel CPU monitors the exposure time by measuring the state of the exp-signal. If, however, the tube head CPU continues the exposure more than the maximum exposure time, then the control panel CPU terminates the exposure and this error occurs. This is a safety procedure, that guarantees that the exposure is terminated under all conditions.

Replace the tube head PCB if this error occurs repeatedly.

E.37 kV feedback signal open circuit or short circuit

The kV feedback signal is monitored by the tube head CPU. The internal connection of the tube head or tube head feedback cable is faulty.

Check the condition of the feedback cable, replace the tube head PCB or the tube head (in this order).

E.38 mA feedback signal open circuit or short circuit

The mA feedback signal is monitored by the tube head CPU. The internal connection of the tube head or tube head feedback cable is faulty.

Check the condition of the feedback cable, replace the tube head PCB or the tube head (in this order).

E.50 Tube head temperature sensor short circuit

The tube head temperature sensor signal is measured by the tube head CPU. The sensor is short-circuited, the tube head PCB or the tube head feedback cable is faulty.

Check the feedback cable. Replace the temperature sensor (beside the signal connectors of the tube head), or the tube head PCB (in this order).

E.51 Tube head temperature sensor open circuit

The tube head temperature sensor signal is measured by the tube head CPU. The temperature sensor is damaged, the tube head PCB or the tube head feedback cable is faulty.

Check the feedback cable. Replace the tube head PCB.

E.52 Filament voltage feedback not in specified limits

The filament voltage is monitored by the tube head CPU. The amplifier is faulty.

Replace the tube head PCB.

E.57 Exposure key pressed/failure during self test

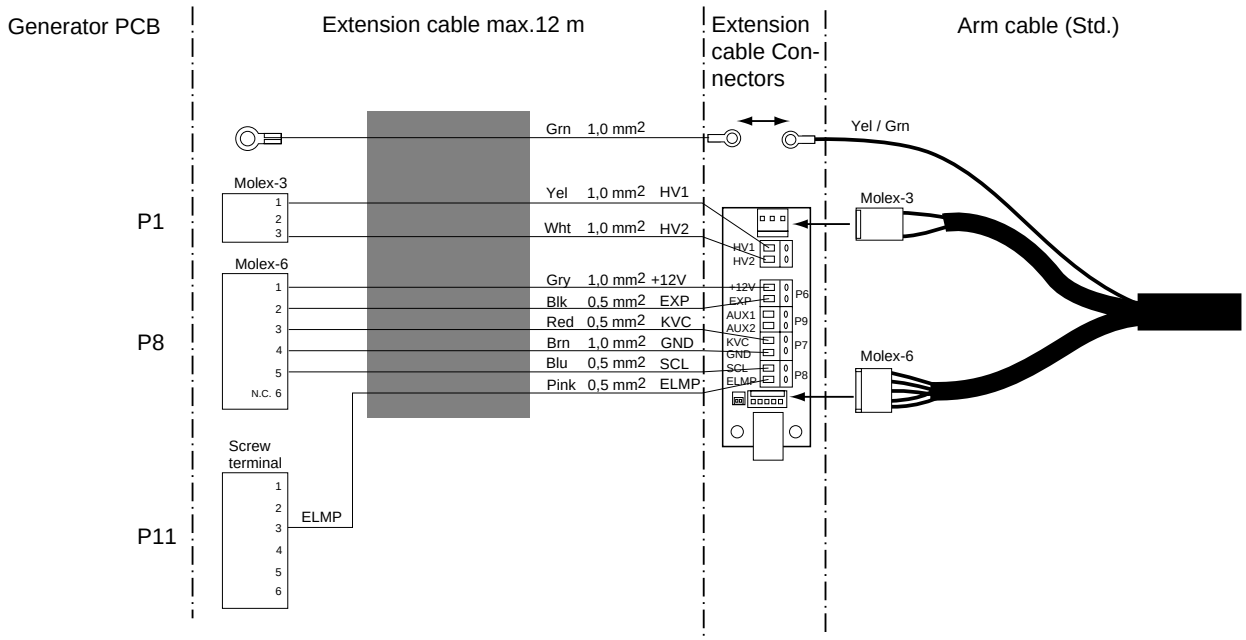
The tube head CPU checks the state of the exp-signal when the unit is switched on. The exposure key or the separate exposure switch can be short-circuited. The arm, extension, control panel or telephone cable can be faulty. The tube head PCB or the generator PCB can be faulty.

Check the cables and the separate exposure switch. Replace the control panel, tube head PCB or the generator PCB (in this order).

E.60 ± 15VDC voltage is out of limits

The tube head CPU measures the internal voltages generated by tube head PCB power supply from the 12V operating voltage. If this error occurs before exposure, the tube head PCB is faulty. If the error occurs after the exposure, the generator 12V power supply is faulty, or the mains filtering capacitors charging circuit is faulty. The extension cable can be too long and/or the wire cross sections too small.

If the error occurs immediately after switching the unit on, replace the tube head PCB. If the error occurs only after starting the exposure, measure the 12 V voltage at the generator PCB P13 connector. If the voltage drops at the beginning of the exposure (generator's green indicator light dims), replace the generator PCB. Check the connectors of the arm cable and the length of the extension cable, as well as the wire cross sections. The properties of extension cable are given in the figure below.



E.61 Communication error between control panel and tube head CPU

The tube head PCB's 12V voltage feed or the communication between the control panel and tube head CPU is failed. The arm/extension cable or control panel/telephone cable is faulty.

Check the cables. Measure the 12V voltage at the tube head PCB P2 connectors pins 1 and 4. Check if the red LED D7 on the tube head PCB is on. Replace the tube head PCB, control panel or the generator PCB (in this order).

E.71 FLASH memory check-sum error (tube head CPU)

Tube head CPU internal error.

Replace the tube head PCB.

E.81 EEPROM memory defective (tube head CPU)

Tube head CPU internal error.

Replace the tube head PCB.

E.83 Config register error (tube head CPU)

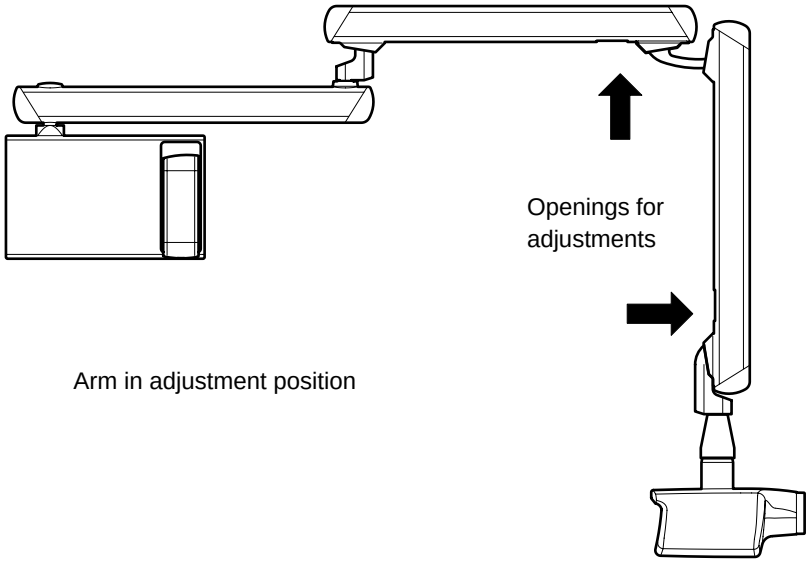
Tube head CPU internal error.

Replace the tube head PCB.

6 MECHANICAL ADJUSTMENTS

6.1 Adjusting the balance of the arm

Adjust the balance of the arm by turning the adjustment nuts with a screwdriver. The adjustment nuts are located inside the bracket arm and can be reached through the openings at the under-side of the bracket arm.



NOTE ***Adjust the arm from the lower part of the adjustment nut.***

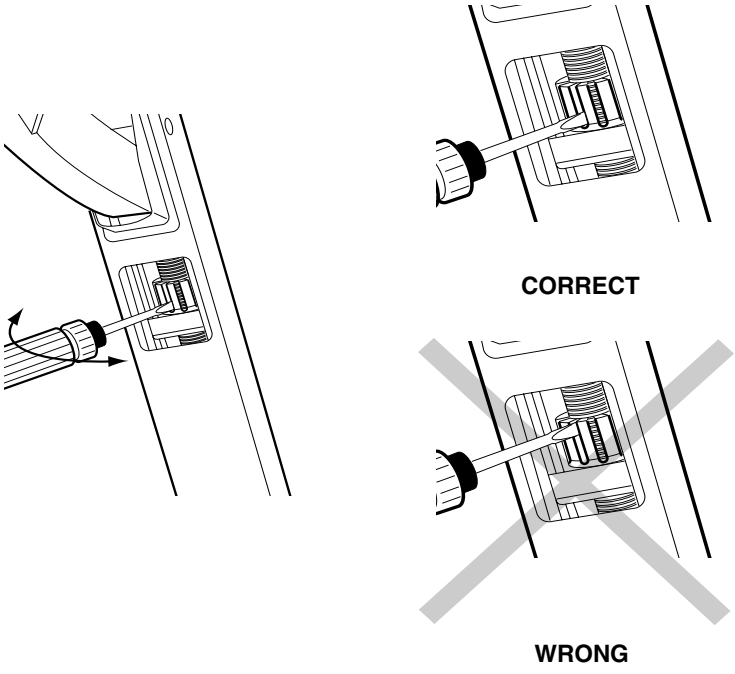


Figure 1

6.2 Adjusting the bracket arm angles

In case the bracket arm angles need to be adjusted it can be done with the limiting plates.

Remove the cover plug from the end of the bracket arm. Attach the limiting plate to the arm with two M3 Allen screws. Adjust the angle with the limiting plate adjustment screws.

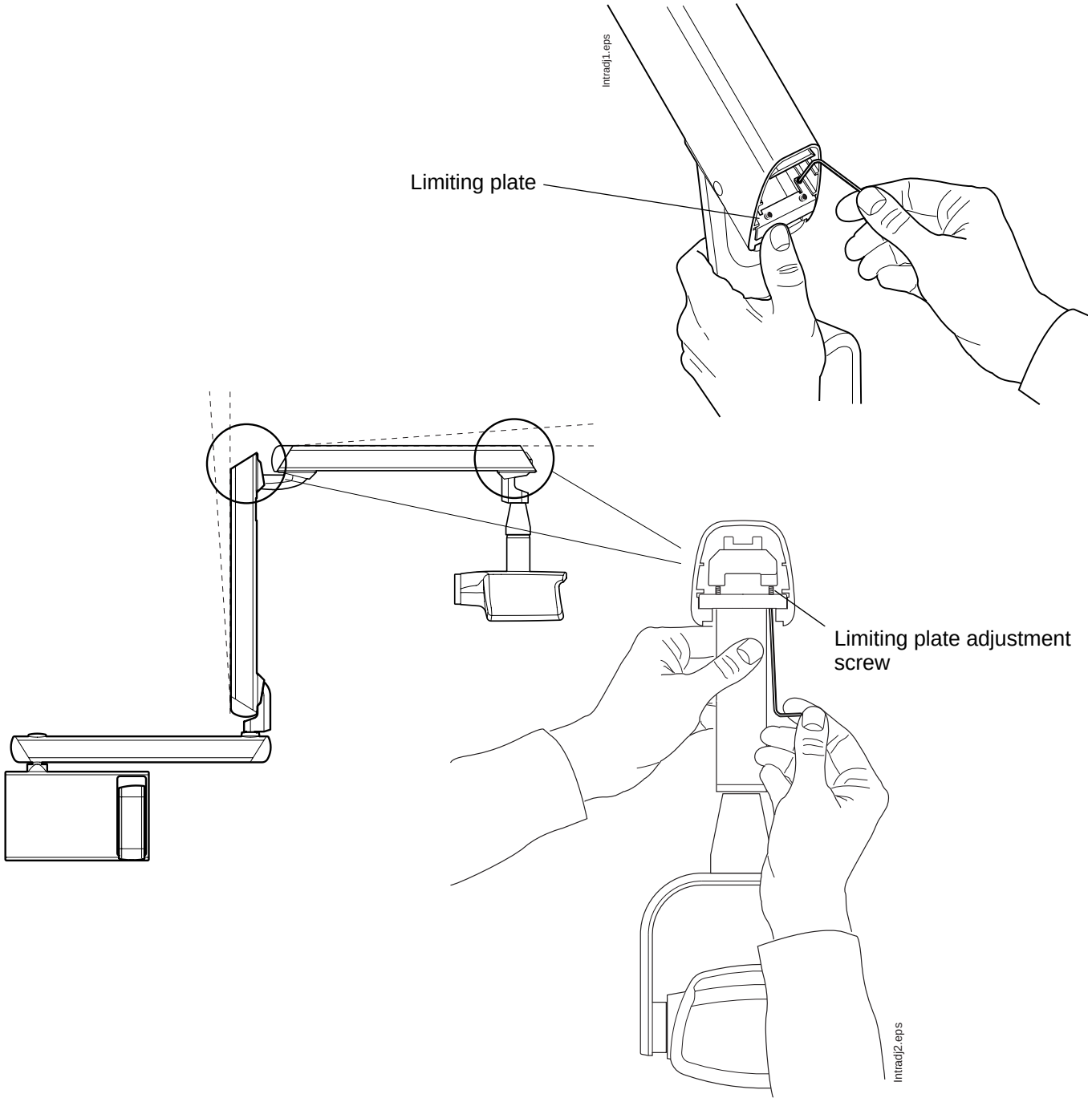


Figure 2

6.3 Adjusting the stiffness of the tube head's horizontal axle

Remove the plug from the tube head's axle and adjust the tightness of the three adjusting screws evenly.

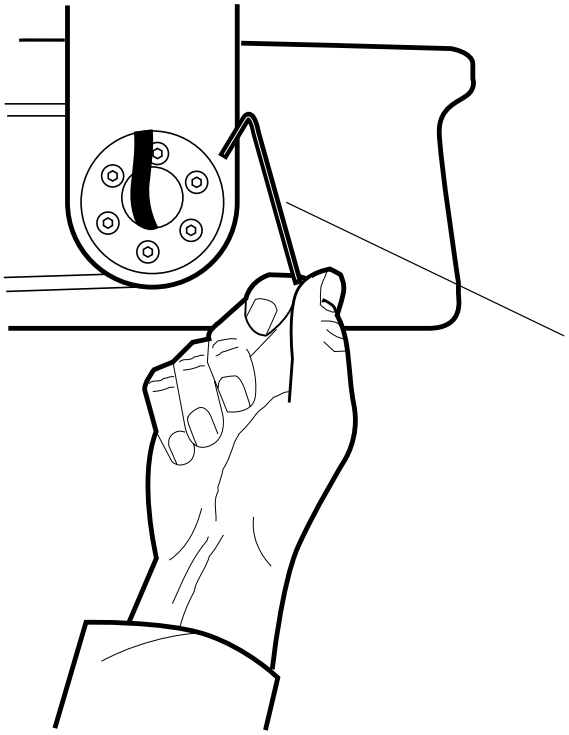


Figure 3

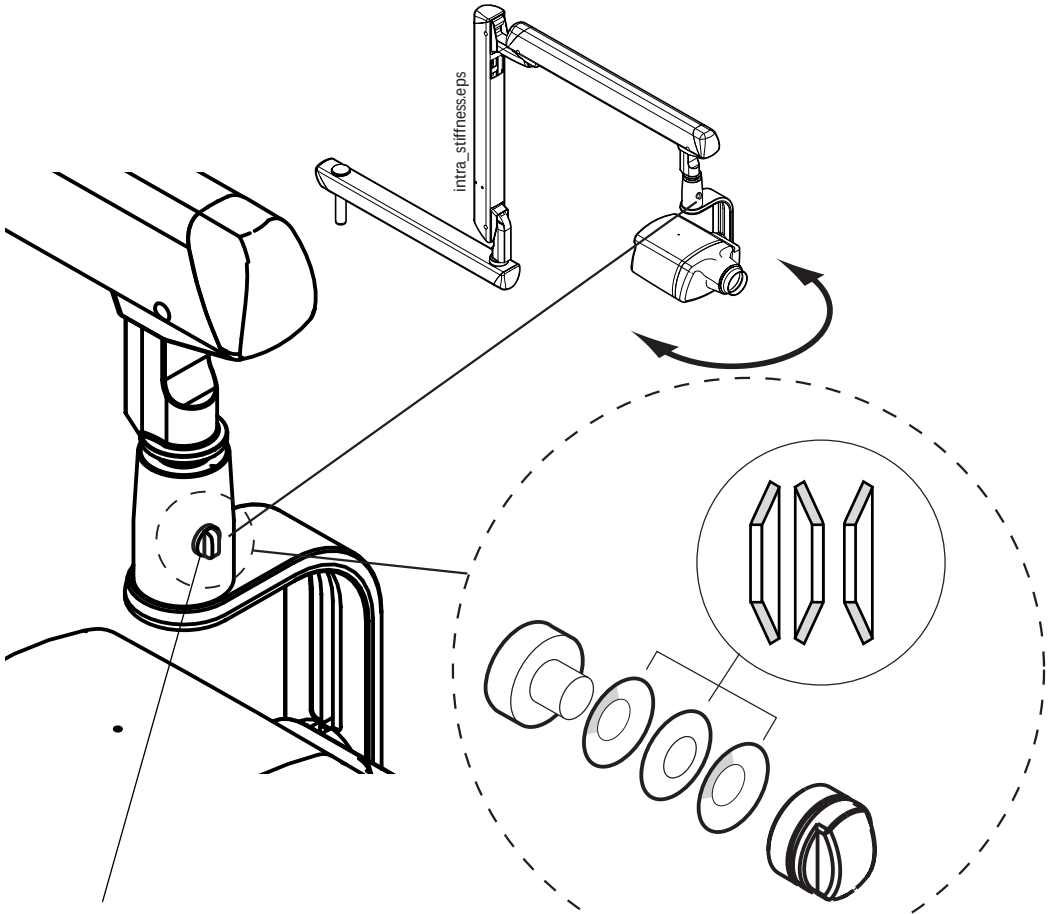
6.4 Vertical tube head stiffness adjustment screw

Adjust the stiffness of the vertical tube head by turning the adjustment screw on the support axle manually or with a wrench tool.

The stiffness of the vertical tube head has been preadjusted at the factory, and can be changed by the user, if necessary.

Turn the adjustment screw 0,5 - 1 rounds clockwise if you want to tighten the tube head and 0,5 - 1 rounds counterclockwise to loosen it.

NOTE ***Do not turn the adjustment screw too much counterclockwise to avoid the screw to come loose.***



7 PARTS REPLACEMENT & REPAIR

WARNING

Make sure that the power supply is switched off before starting parts replacement.

7.1 Replacing the Generator PCB

a) Unscrew the three M4x8 ISO 7380 screws and remove the generator cover.

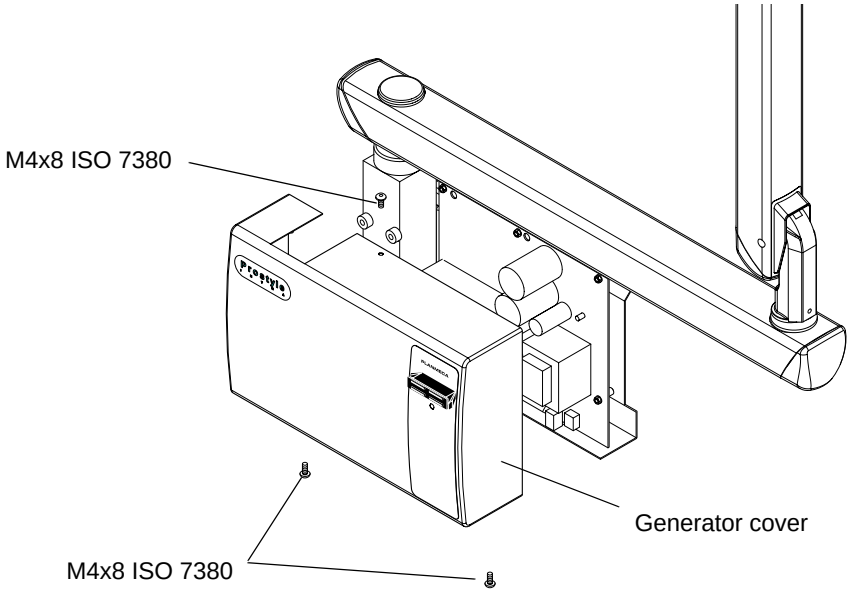


Figure 4

b) Measure that the mains voltage is not present at the mains input terminals (P5) marked N and L.

c) Disconnect the connectors from terminals P1, P3, P5, P6 P7, P8, P9 and P10.

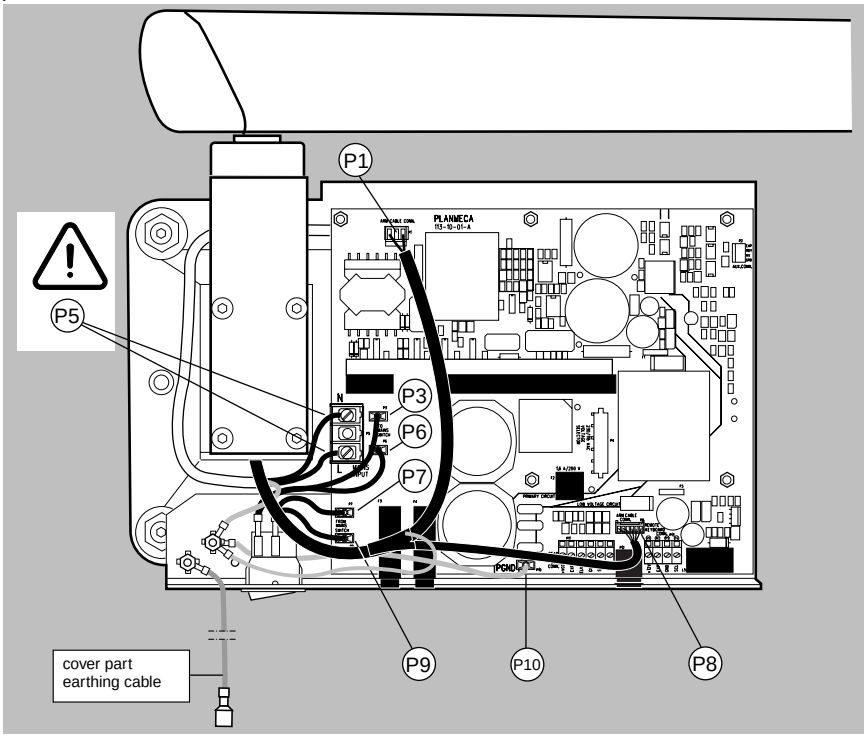


Figure 5

d) Remove the six M4 DIN 934 mounting nuts and M4 washers from the Generator PCB.

e) Remove the Generator PCB.

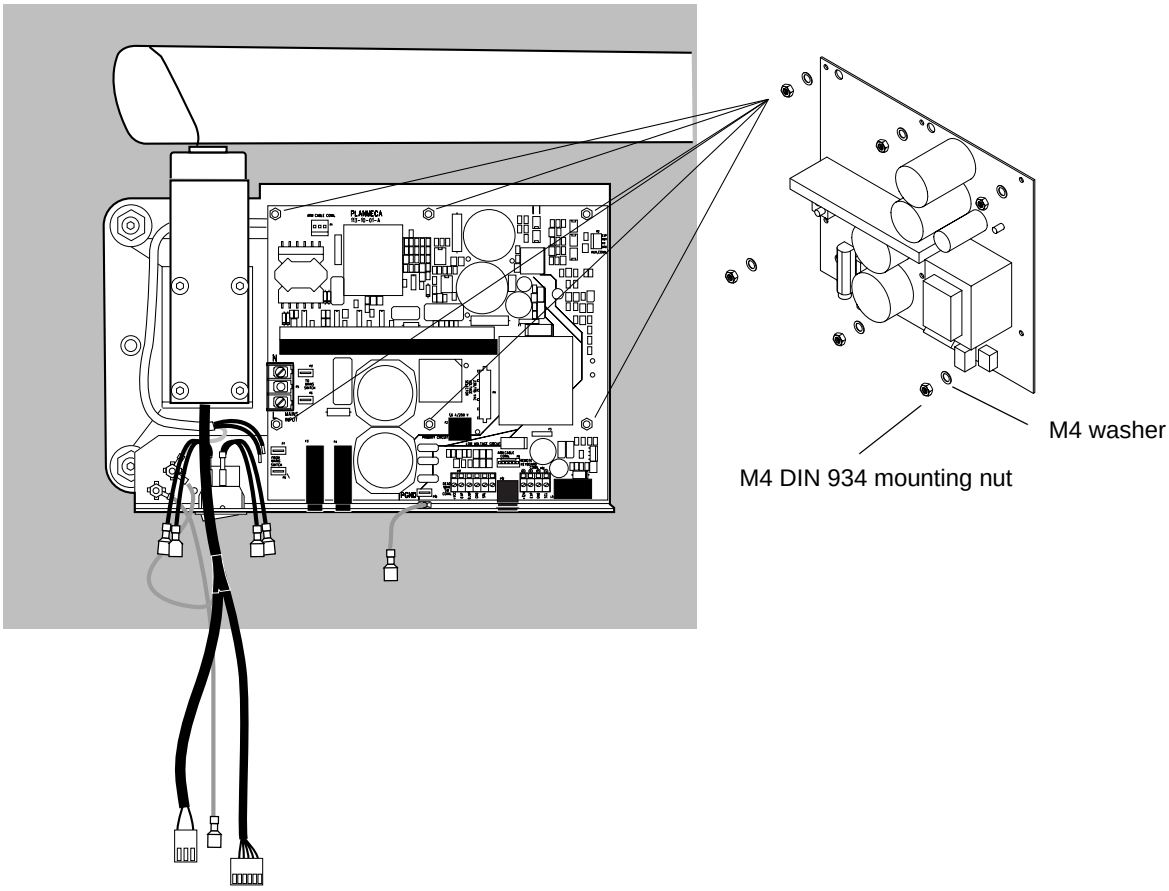


Figure 6

f) Install the new Generator PCB in reverse order.

7.2 Replacing the tube head PCB

a) Unscrew the two M4x20 DIN 7984 fastening screws (Fig. 7, 1) of the cone (Fig. 7, 2) (inside the cone).

b) Remove the tube head front cover (Fig. 7, 3) and the cone.

c) Disconnect the two connectors from the tube head PCB (Fig. 7, 4).

d) Pull the tube head PCB (Fig. 7, 5) from the tube head.

e) Install the new PCB in reverse order.

f) Perform the x-ray tube filament preheating voltage calibration, see section 2.3 “X-ray tube filament preheating voltage calibration” on page 6.

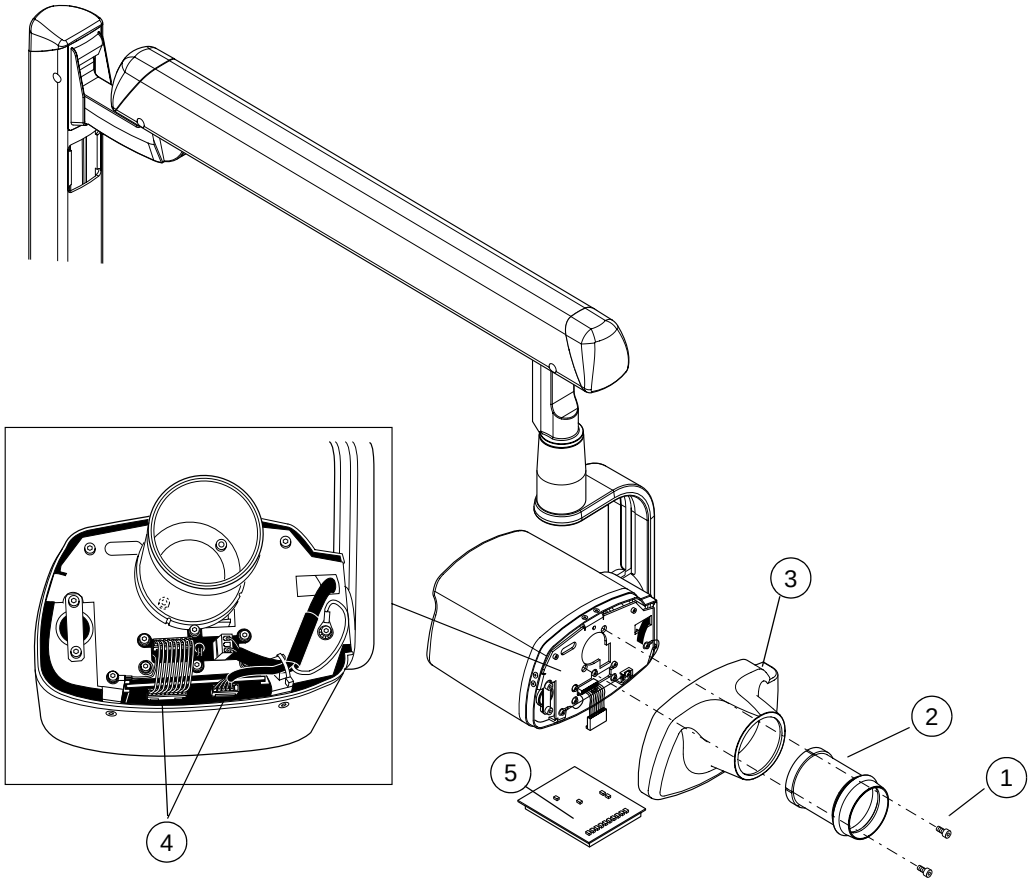


Figure 7

7.3 Replacing the tube head

a) Remove the tube head PCB as described in section 7.2 “Replacing the tube head PCB” on page 21.

b) Unscrew the six fastening screws of the tube head cover (Fig. 8, 1) and remove the cover (Fig. 8, 2).

c) Unscrew the five screws from the support frame (Fig. 8, 3) and remove the tube head (Fig. 8, 4).

d) Install the new tube head in reverse order.

NOTE ***Do not overtighten the tube head cover fastening screws to avoid damaging the cover.***

e) Perform the x-ray tube filament preheating voltage calibration, see section 2.3 “X-ray tube filament preheating voltage calibration” on page 6.

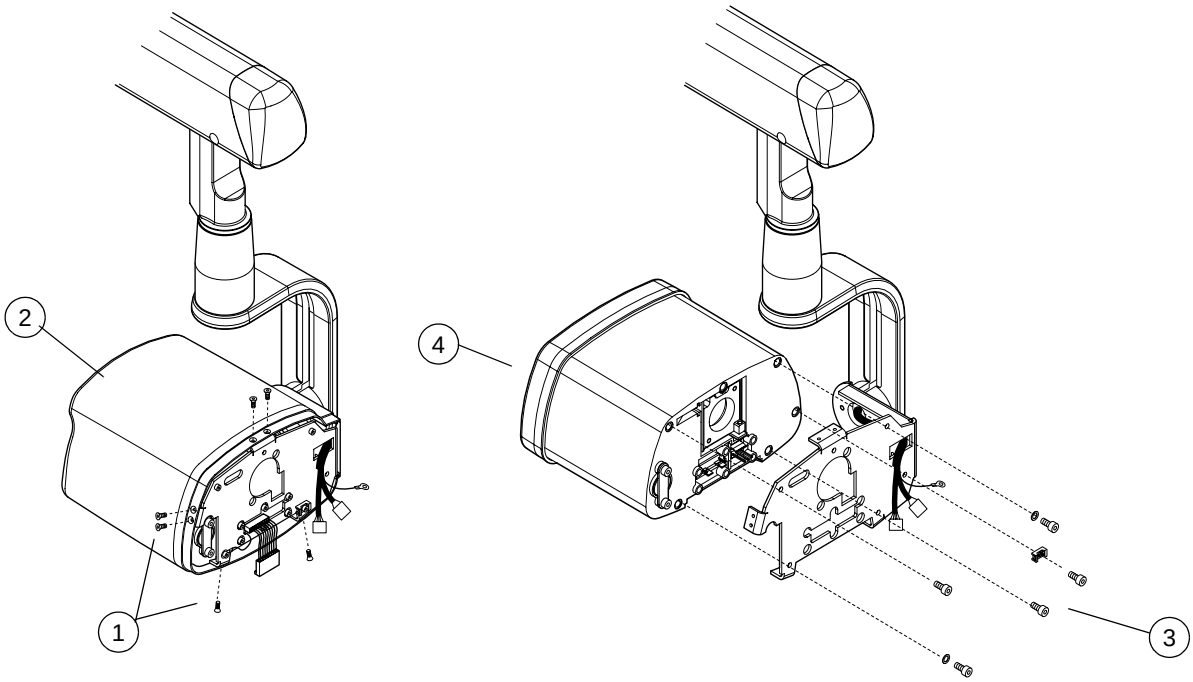


Figure 8

7.4 Replacing the arm cable

a) Remove the tube head as described in section 7.3 “Replacing the tube head” on page 22.

b) Unscrew the three M4x8 ISO 7380 screws (Fig. 9, 1) and remove the generator cover (Fig. 9, 2).

c) Disconnect the arm cable connectors from the Generator PCB (terminals P1 and P8). Detach the grounding lead of the arm cable. (Fig. 9, 3).

d) Remove the extension arm cover plugs (Fig. 9, 4).

e) Push the arm cable through the extension arm.

f) Detach the plug of the tube head support (Fig. 9, 5).

g) Unscrew the M3x6 ISO 7380 screw of the tube head support (Fig. 9, 6) and remove the cover plate of the tube head support (Fig. 9, 7). The plate is attached with double-sided adhesive tape.

h) Cut off the connectors from the tube head end of the arm cable push the cable through the support frame (Fig. 9, 8).

i) Cut off the connectors from the generator end of the arm cable. The grounding lead should be left longer that the other leads (Fig. 9, 9).

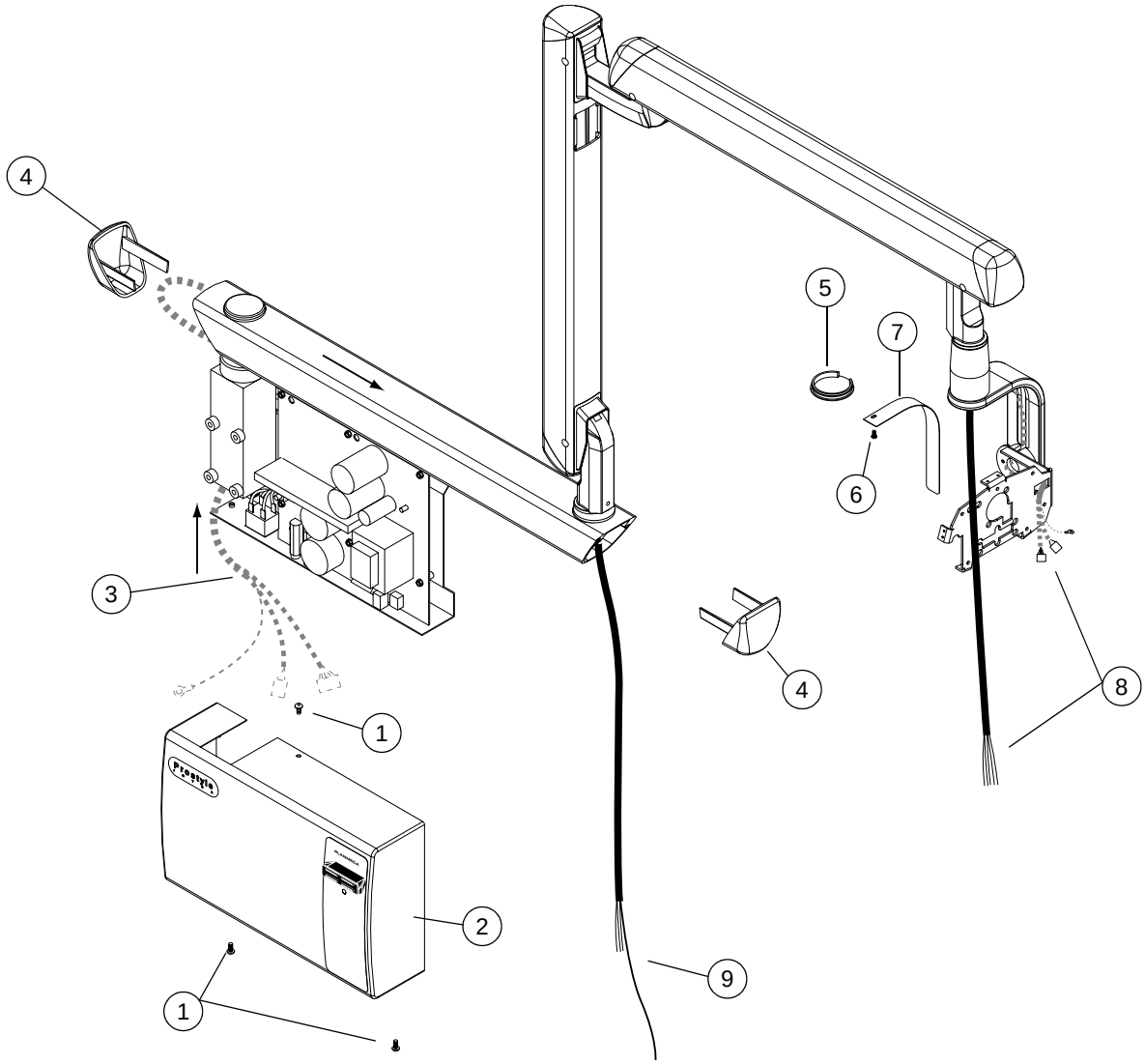


Figure 9

j) Join the old and new cables together as described in Fig. 10 below. Tape the joining point firmly.

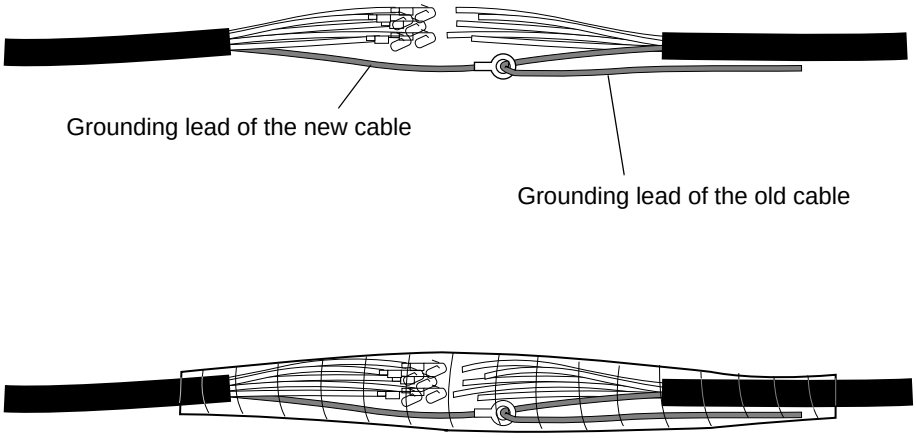


Figure 10

k) Coat the new arm cable with silicone, grease or similar. Pull from the tube head end of the arm cable and simultaneously move the arm up and down..

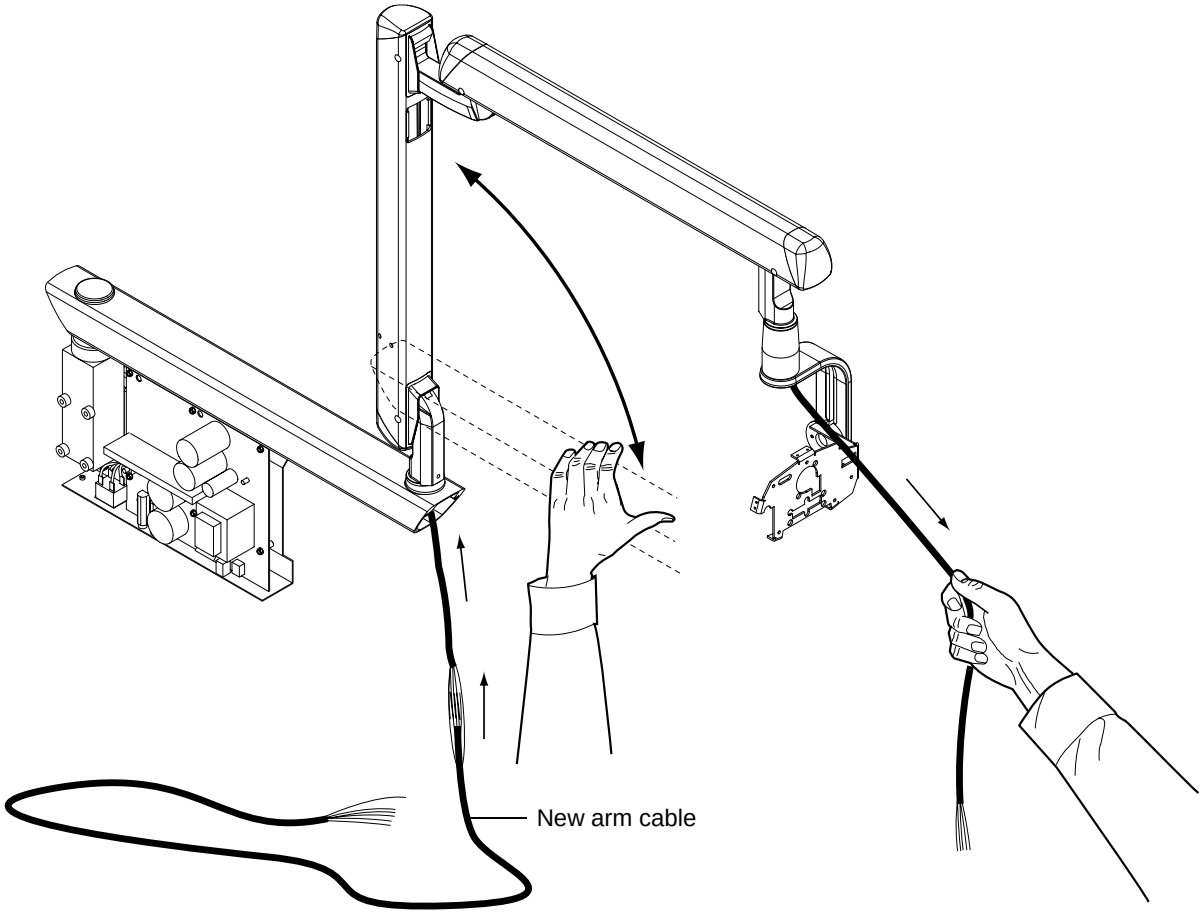


Figure 11

l) Stop pulling when the new cable is 390-400 mm out from the opening of the tube head support (Fig. 12, 1). Route the cable through the opening on the support frame (Fig. 12, 2).

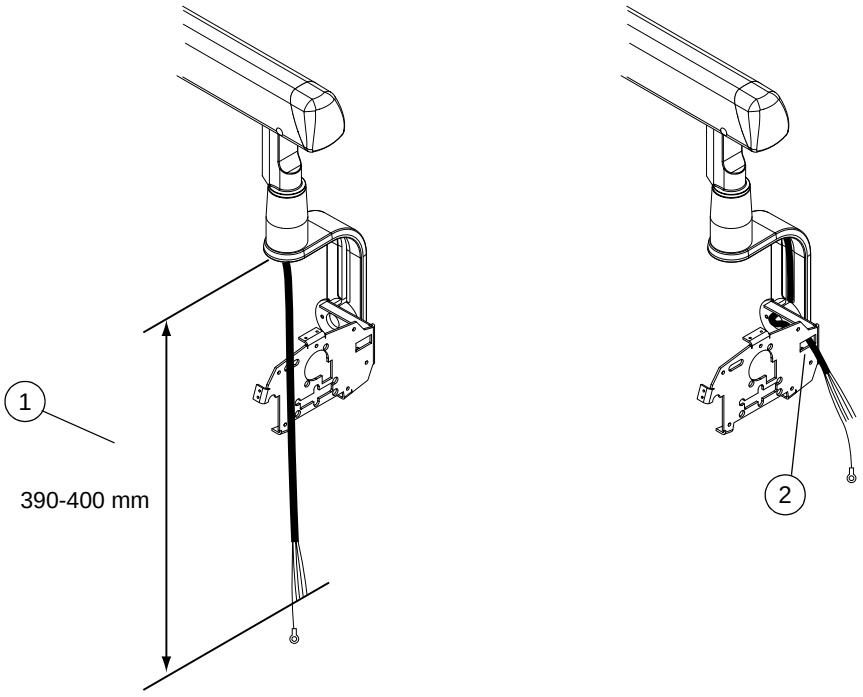


Figure 12

m) Attach the tube head to the support frame with the five M4x8 DIN 7984 screws.

n) Slide the tube head PCB into its position and connect the feedback cable to the tube head PCB terminal P1.

o) Connect the arm cable leads to the connectors as described in Fig. 13 below.

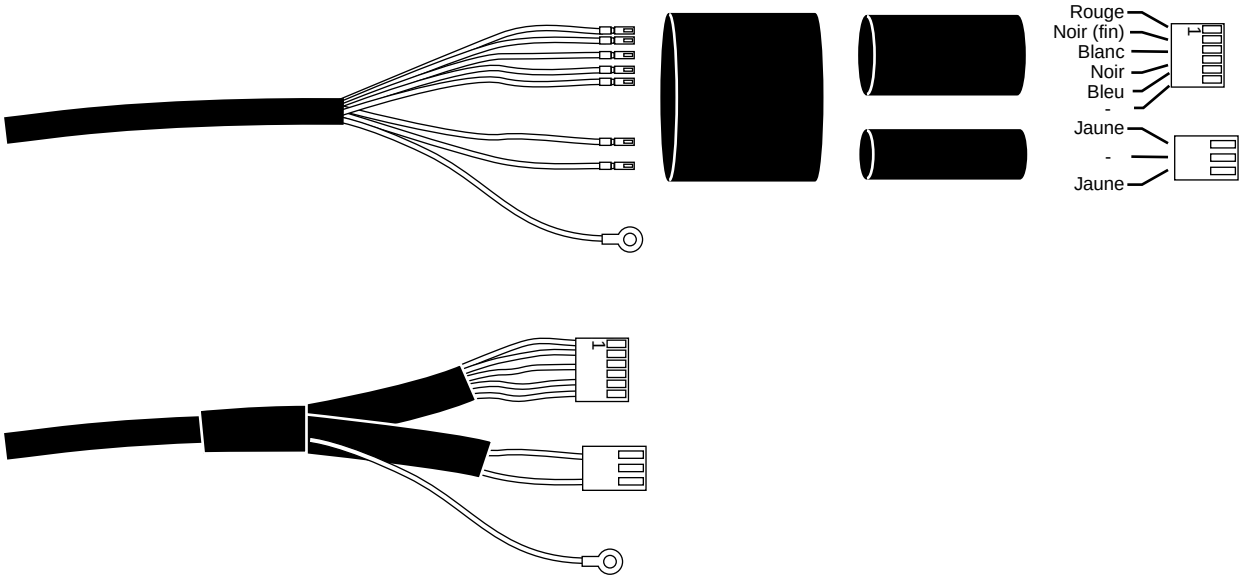


Figure 13

p) Connect the arm cable to the tube head PCB and connect the grounding lead to the grounding point near the support frame opening..

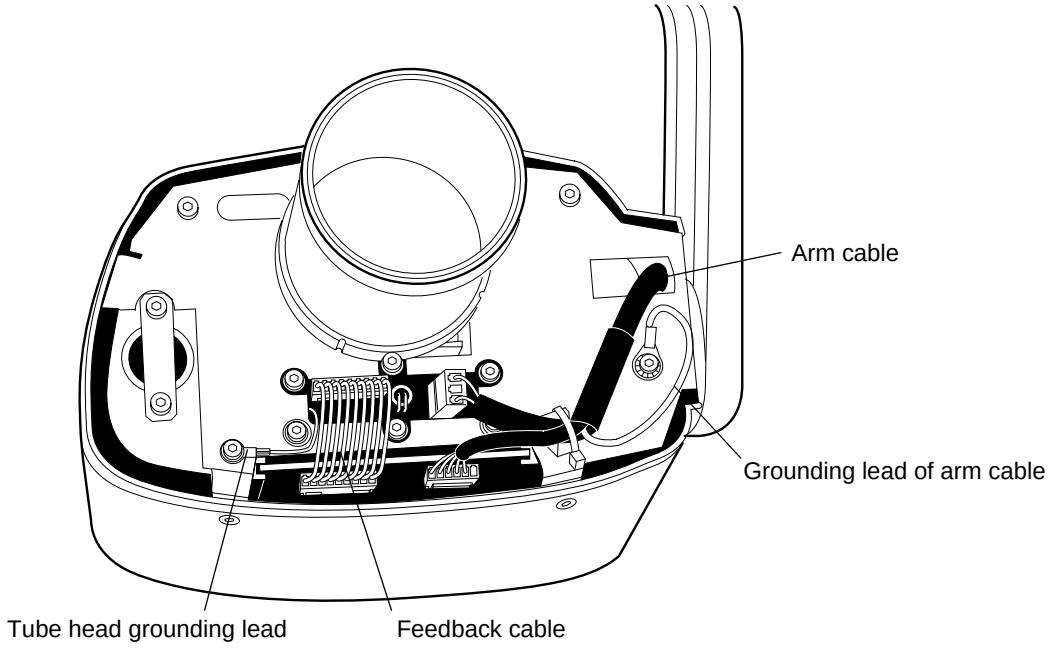


Figure 14

q) Check that the arm cable remains in the groove of the tube head support when moving the arm from one extreme position to another. Secure the arm cable to the support frame with a cable tie.

r) Replace the removed covers and plugs.

7.5 Replacing the control panel cable

a) Press the clip of the connector (Fig. 15, 1) and pull the socket from the terminal of the generator box (Fig. 15, 2).

b) Detach the connector from the control panel in the same way as from the generator box.

c) Connect the new cable to the generator box and to the control panel.

CAUTION

Do not connect any other equipments to the terminal of the generator box..

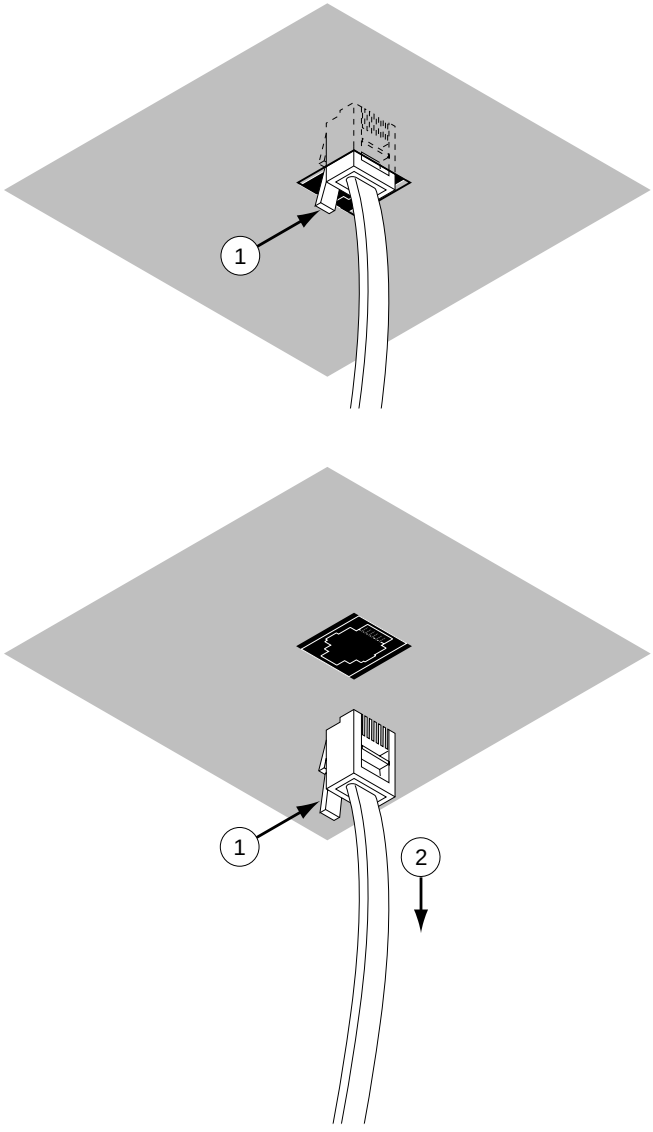
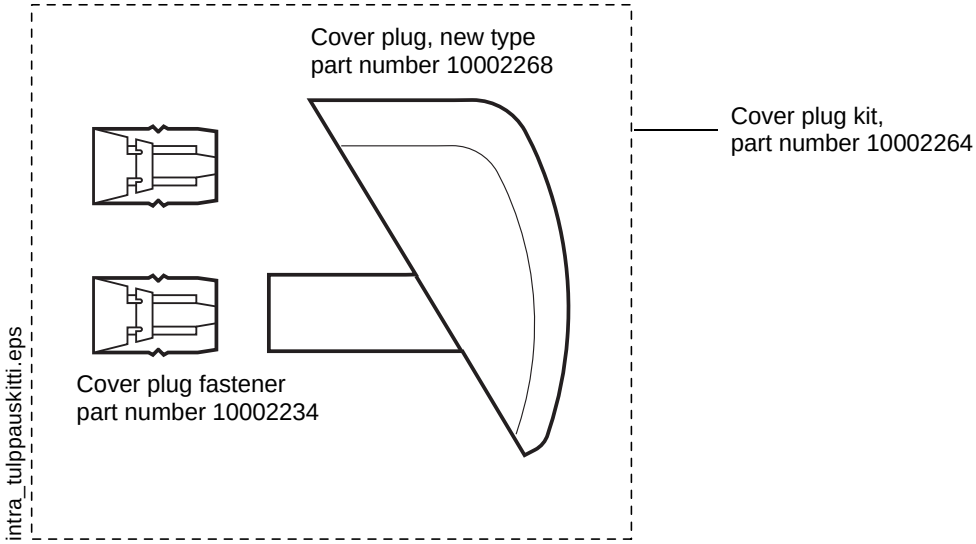


Figure 15

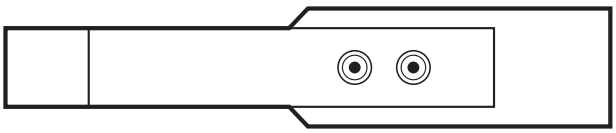
7.6 Attaching the new type arm cover plug

NOTE ***The Prostyle Intra x-ray units manufactured after March 2000, serial number IXRA13370 or greater are equipped with new type arm cover plugs. In case you want to use these cover plugs in older x-ray units, replace the cover plugs according to the instructions given below.***

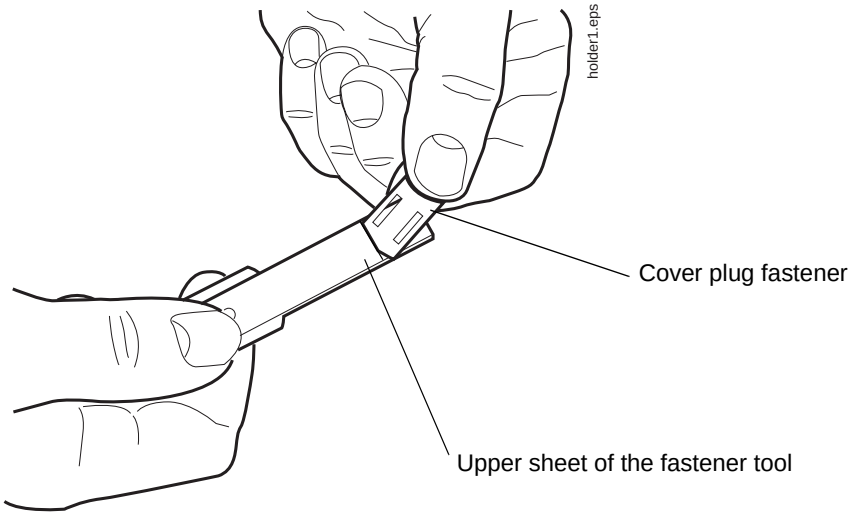
You need a new type cover plug and two fasteners to one arm end. The cover plug and fastener can also be ordered separately.



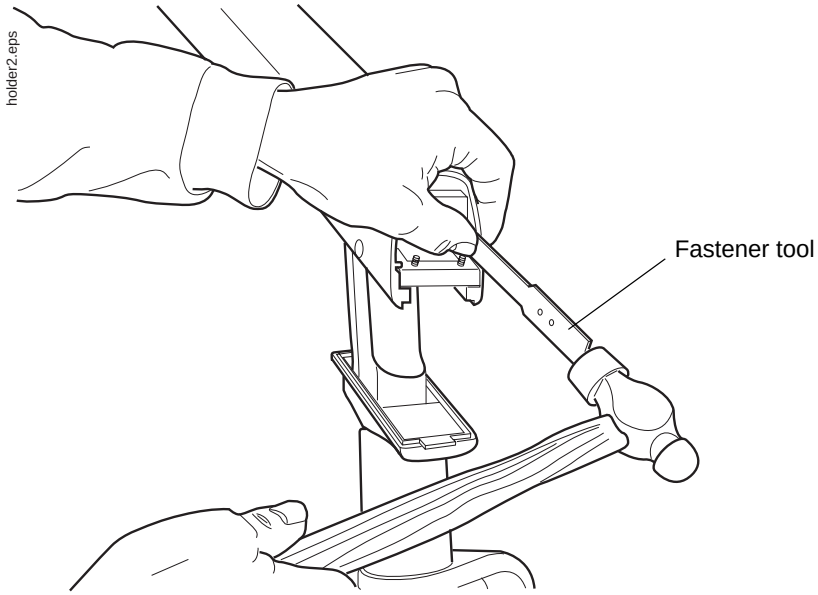
NOTE ***You can use a special fastener tool (part number 10002238) to attach the cover plug fastener to the arm.***



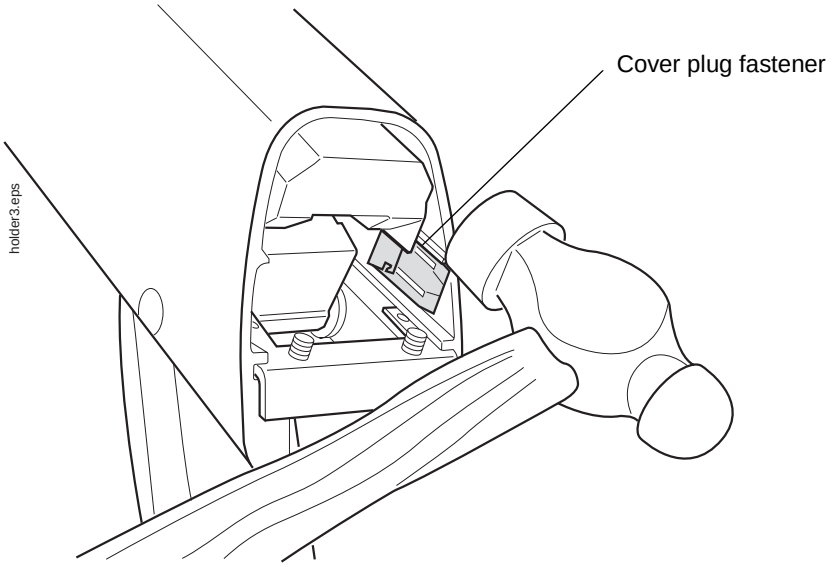
Attach the cover plug fastener to the tool by sliding the fastener under the upper sheet of the tool.



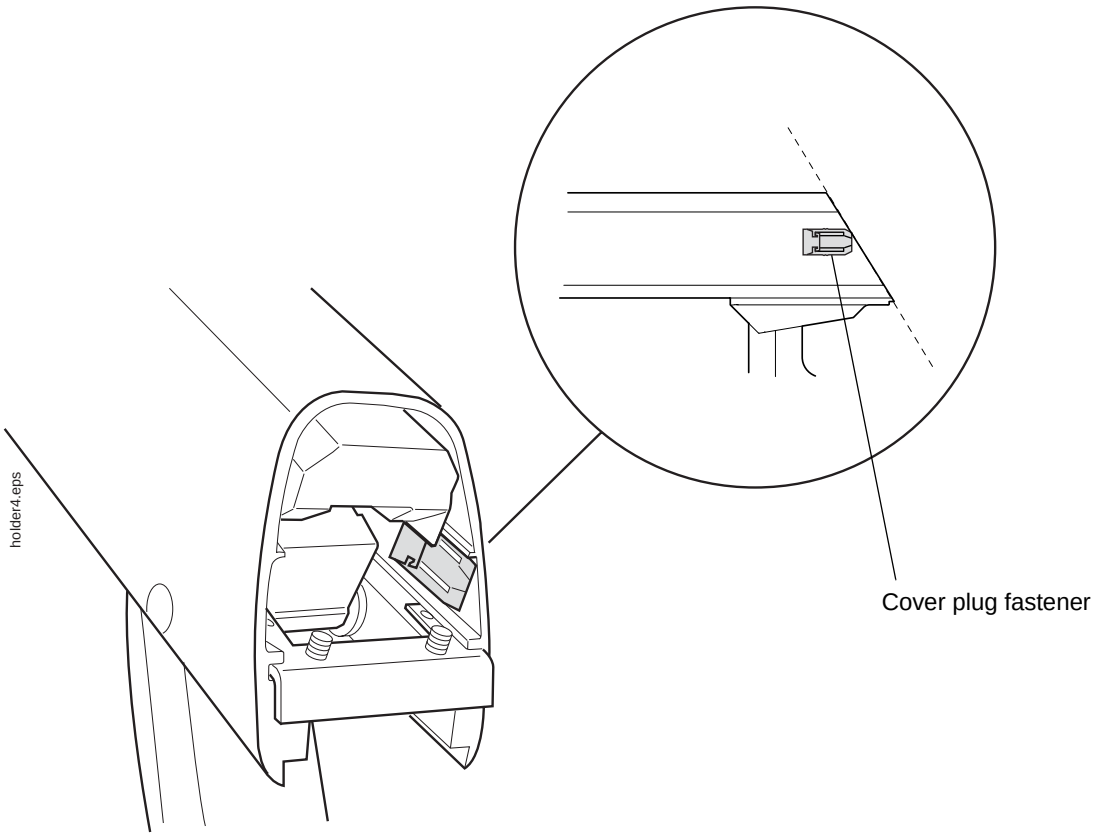
Attach the cover plug to the arm as shown on the figure below.



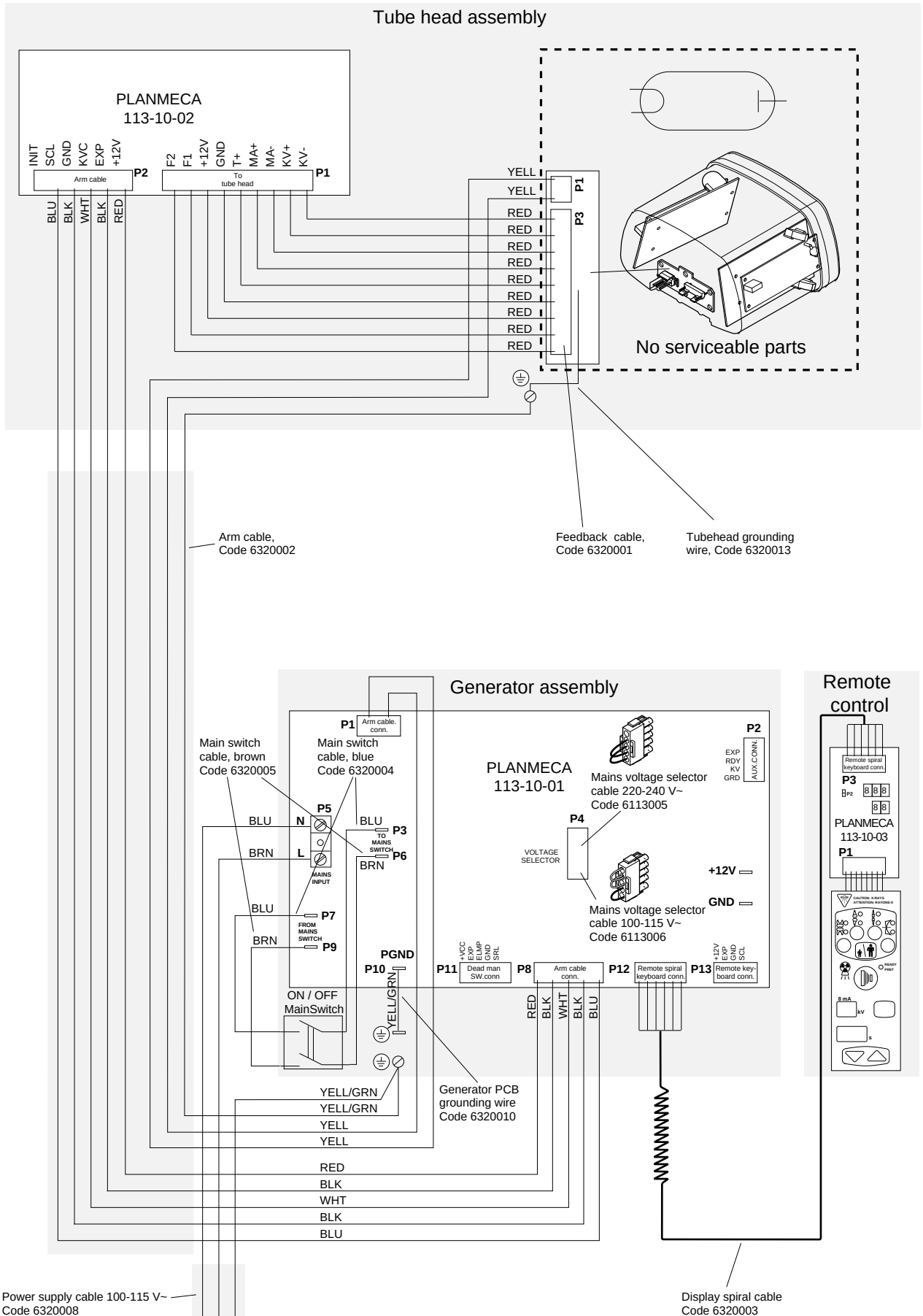
You can also attach the cover plug fastener into the arm without using the fastener tool.



The cover plug fastener must be positioned so that its upper corner is level with the arm end (see figure below).



8 DIAGRAMS



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	Designed J.Pennanen	Wiring diagram, standard wall mounting installation
	Drawn S.JŠnkŠvaara	
	Approved J.Pennanen	Rev.B

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