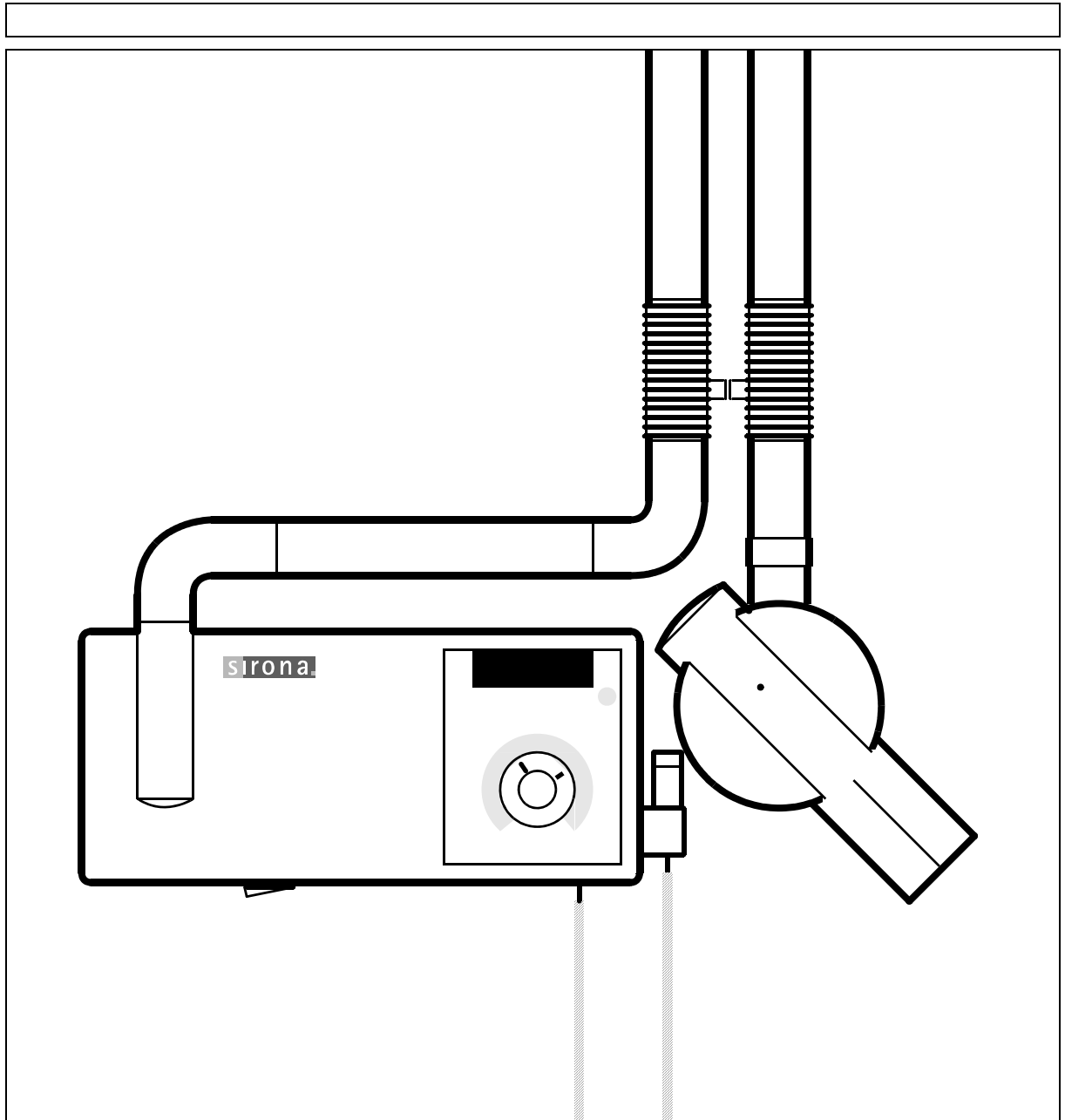


HELIODENT DS

Maintenance Instructions



ATTENTION!

Adequate lead proofing of room and operator position is essential.

Since these requirements vary from state to state it is the assembler's / installer's responsibility that all local radiation safety requirements are met.

General

In order to ensure in compliance with the DHHS requirements the HELIODENT®DS must be maintained annually following date of installation. It is the responsibility of the user to ensure that the equipment is maintained in accordance with the manufacturer's recommended **Maintenance Instructions** to ensure compliance with the Federal Performance Standard.

The manufacturer and the assembler/installer are not responsible for disturbances in operation when the equipment is not used in accordance with the operating instructions. The maintenance inspection and consequent service must be accomplished by a skilled technician. Neither the inspection nor service is part of the equipment warranty.

Technical instructions required

Operating Instructions and Service Manual

Instruments required

1. Digital multimeter model FLUKE 8000 A, or equivalent
 Accuracy: AC voltage ± 0.5% of reading plus 1 digit
 DC voltage ± 0.1% of reading plus 2 digits
 DC current ± 0.3% of reading plus 1 digit
2. Electromechanical pulse counter,
 model KESSLER ELLIS KT 203 ±1 pulse, or equivalent

CAUTION RADIATION

Observe radiation protection guidelines as outlined in the Operating Instructions!



CAUTION Technician!

PC-boards are fitted with electronic components sensitive to electrostatic discharge (ESD). Electrostatic discharge is unavoidable due to friction of clothing, carpeting etc.

ATTENTION

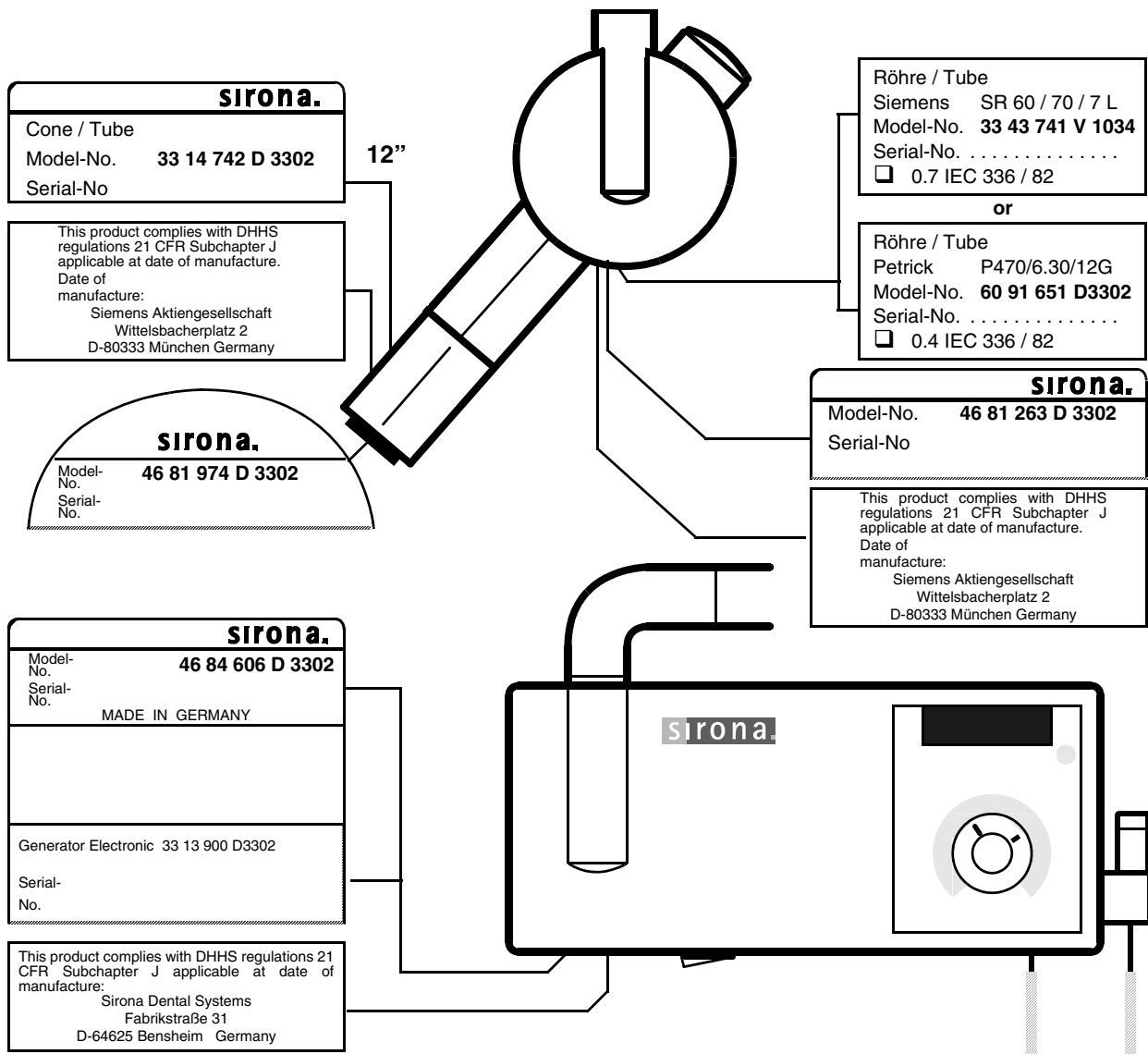


**To prevent damage of electronic components do not touch same.
 Discharge your electrostatic energy by touching a grounded point.**

Always handle circuit boards by the edge of same.

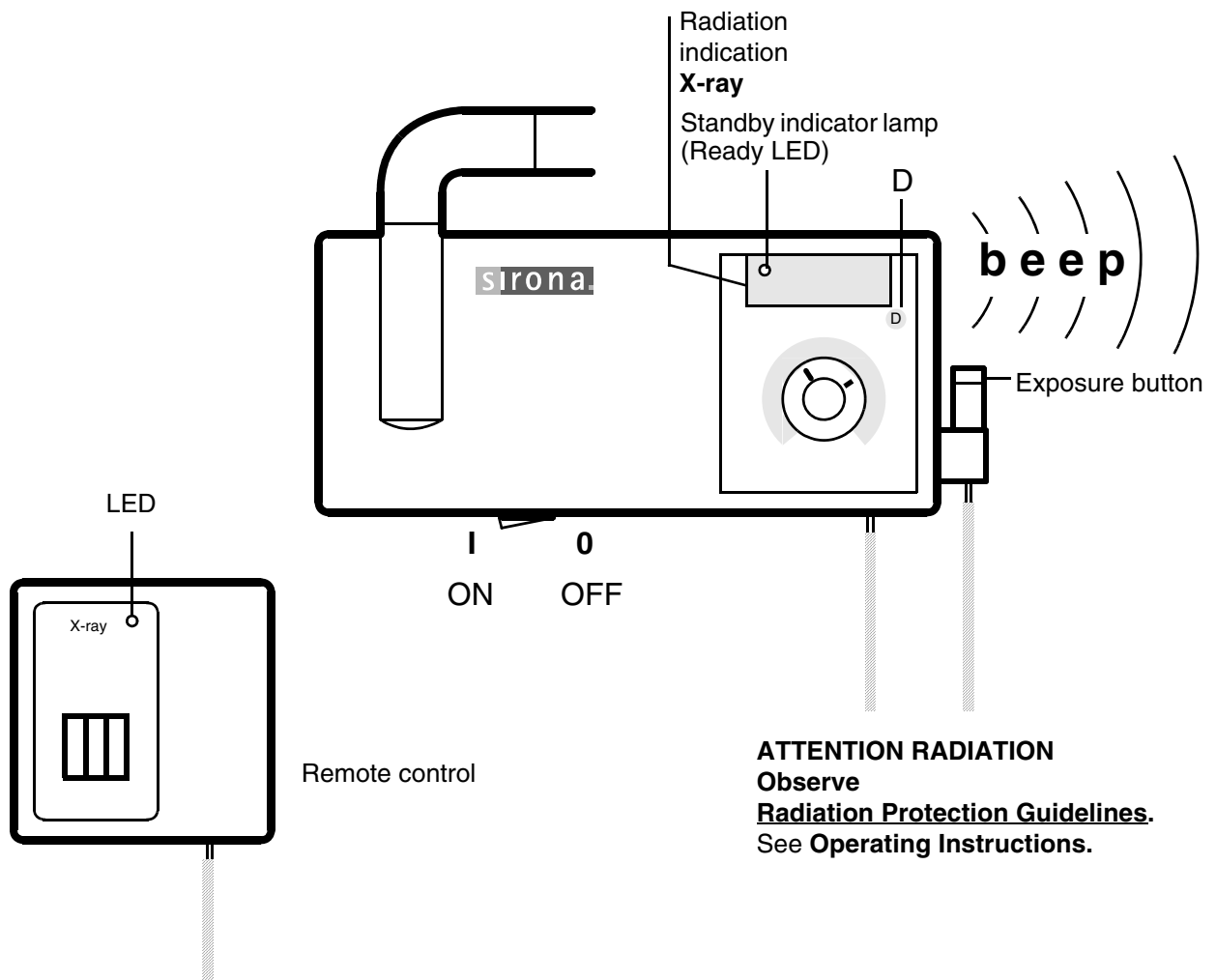
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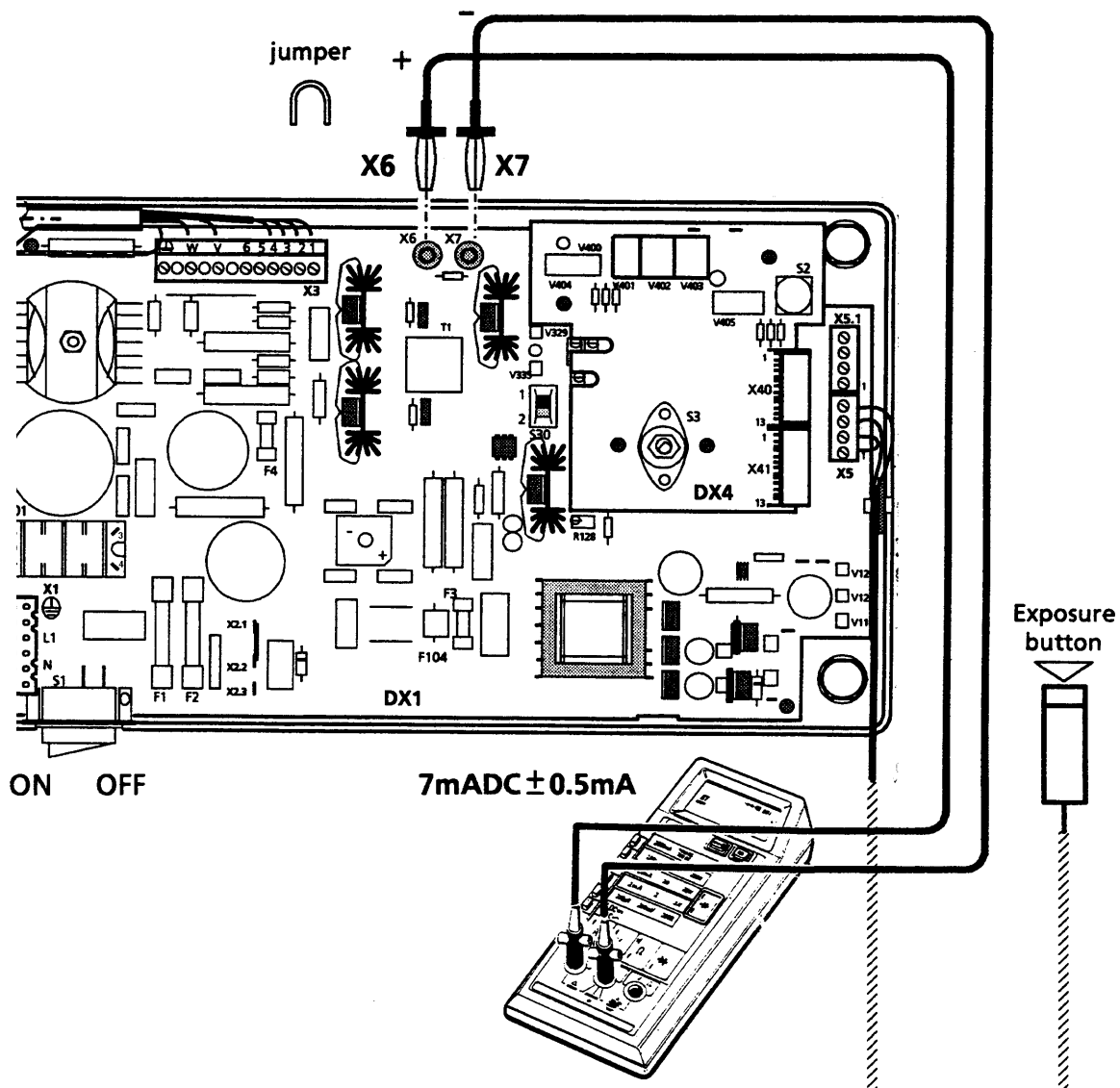
Visual Check

- Look for mechanical damage, possibly affecting radiation safety.
- Inspect cone for possible cracks.
- Check the mechanical functions.
Test the tubehead in all working positions for possible drift.
- Verify that all labels are affixed and legible.
Defaced labels must be replaced.
To order the above, write to Sirona Dental Systems (address, see rear) giving details on: Customer Name
Customer Address
All Model Numbers with
Serial Numbers still legible on the unit for identification purposes.
For serial numbers see also **Unit Passport**.



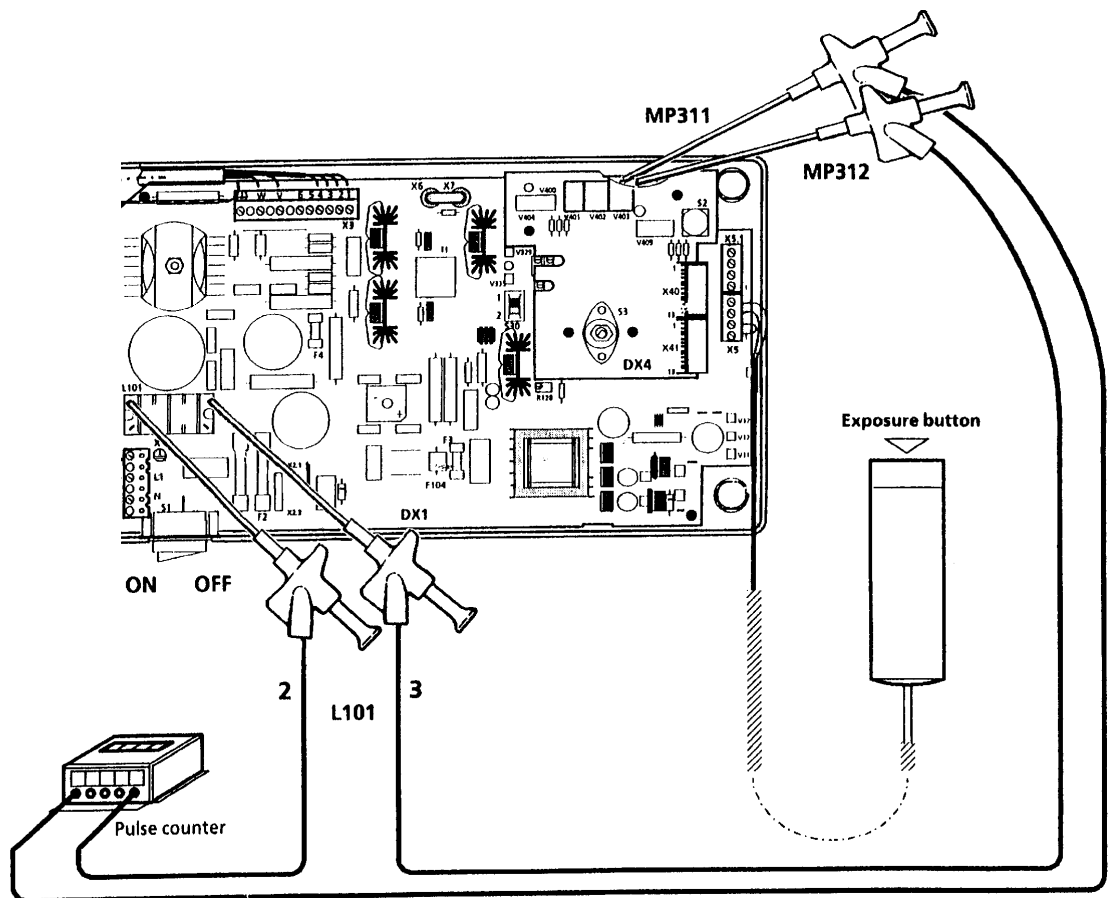
Light Indicators at the Display, Audible Sound at the Wall Adapter.

- Switch unit **ON** with master power switch. The stored exposure data must light up on the display, see **Operating Instructions** under "Preparing the exposure".
- Make an exposure:
 - Set the exposure time to **1.00 s** for conventional radiography technique (Digital must not light up).
 - **CAUTION RADIATION:** Depress the exposure button and hold until the exposure terminates automatically. The radiation indication **X-ray** must light up during the exposure period. Simultaneously an **audible beep** must sound at the wall adapter. In operation with remote control, the **LED** on the remote station must light up as well. The **Standby indicator lamp / Ready LED** flashes until the automatic cooling down time of the tube assembly has expired.
- Interrupt an exposure – deadman feature:
 - Set the exposure time to 3.2s.
 - **CAUTION RADIATION:** Press the exposure button until **X-ray** lights up and subsequently release – the exposure must terminate immediately. The selected exposure time blinks until the automatic cooling down time of the tube assembly has expired.
- Defective light indicators constitute a safety hazard to the patient as well as to the operator. **CAUTION:** The user is not permitted to use the unit until light indicators have been replaced!



Tube Current Verification

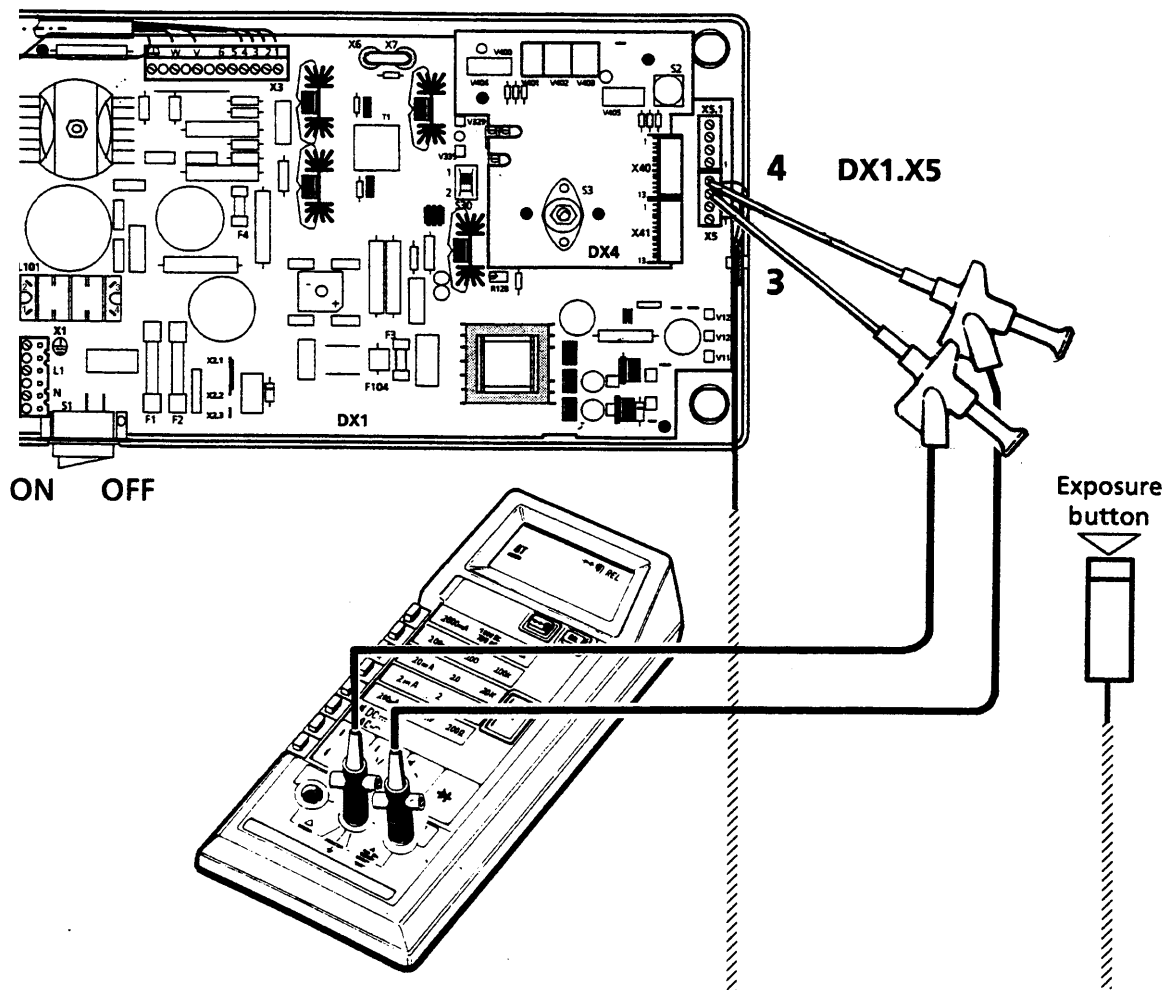
- Turn unit OFF and remove housing (see **Service Manual!**).
- Remove jumper from test points DX1.X6/X7.
- Connect multimeter to X6+/ X7 -, range 10mADC.
- Turn unit ON.
- Set the exposure time on the control panel to 3.2s, using the object selector switch (conventional radiography technique).
- CAUTION RADIATION: Make an exposure.
- The reading should be $7\text{mADC} \pm 0.5\text{mA}$. z z **Record reading.**
- If specified value is obtained **turn unit OFF (WARNING: Electrical shock hazard!)**.
- Remove meter leads and replace jumper!
 - If specified value cannot be obtained, see Service Manual, chapter "Tube Current Verification".



Exposure Time Verification

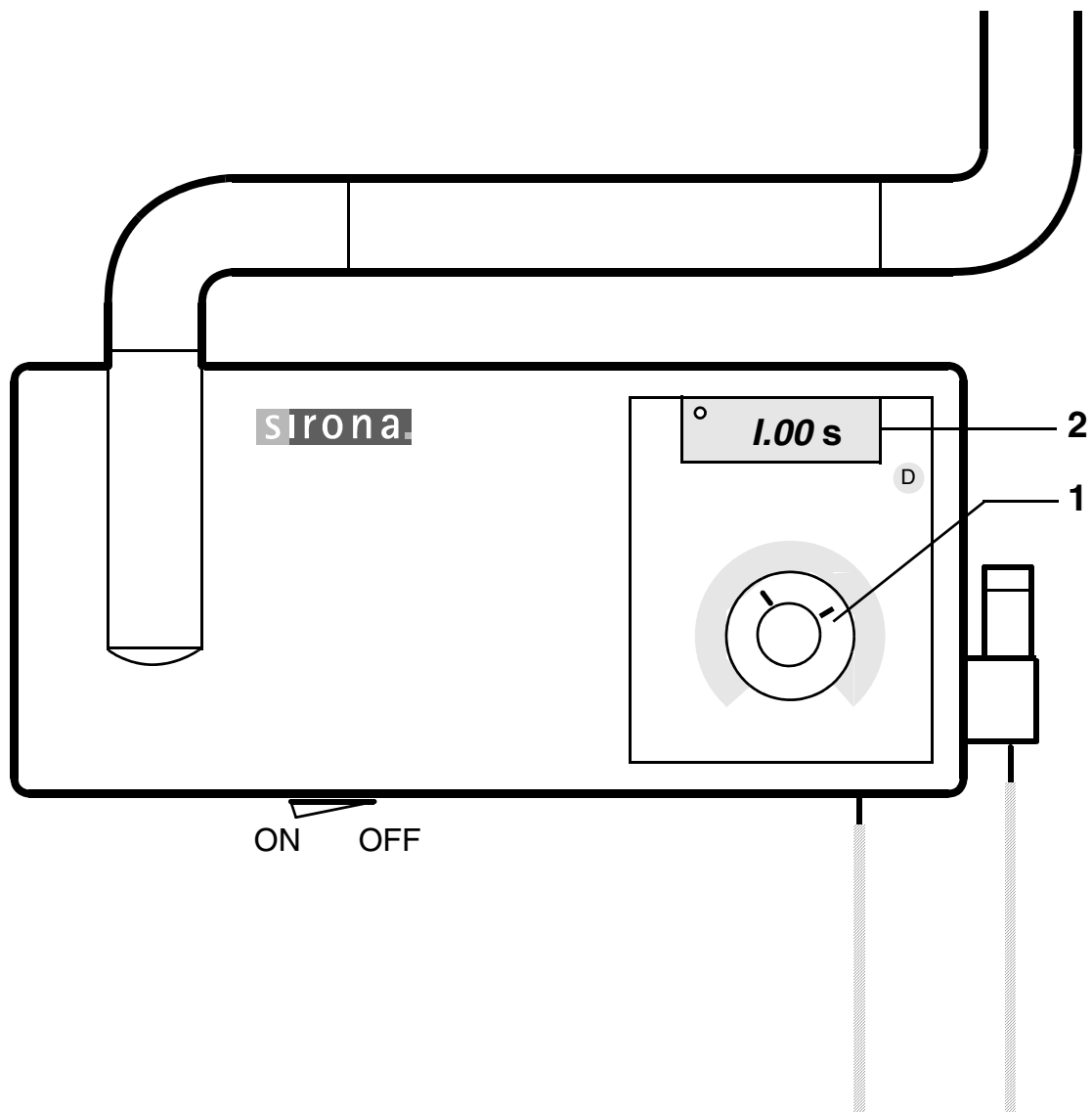
(conventional radiography technique)

- For testing the exposure times a mechanical pulse counter is needed.
 - Switch unit OFF (**WARNING: Electrical shock hazard!**) and connect the test leads to testpoints **MP311/MP312** on PCB **DX1**.
 - Switch unit ON.
 - Make an exposure with each of the exposure times given. **CAUTION RADIATION!**
 - Observe the cooling time between exposures. The Standby indicator lamp / Ready LED flashes until the automatic cooling down time of the tube assembly has expired.
 - Set exposure times using the object selector switch (see Operating Instructions).
- | | | | |
|--------------------|---------------------|---------------------------|-----------------------------|
| Exposure time 0.4s | at 60Hz: 24 pulses | Tolerance ± 1 pulse, | at 50Hz: 20 pulses ± 1 |
| Exposure time 3.2s | at 60Hz: 192 pulses | Tolerance ± 9 pulses, | at 50Hz: 160 pulses ± 8 |
- **Record indicated pulse count.** Reset counter after each exposure.
 - Switch unit OFF (**WARNING: Electrical shock hazard!**) and disconnect pulse counter.
 - If the measured pulse count is not within specified tolerance, see Service Manual, chapter "Exposure Time Verification".



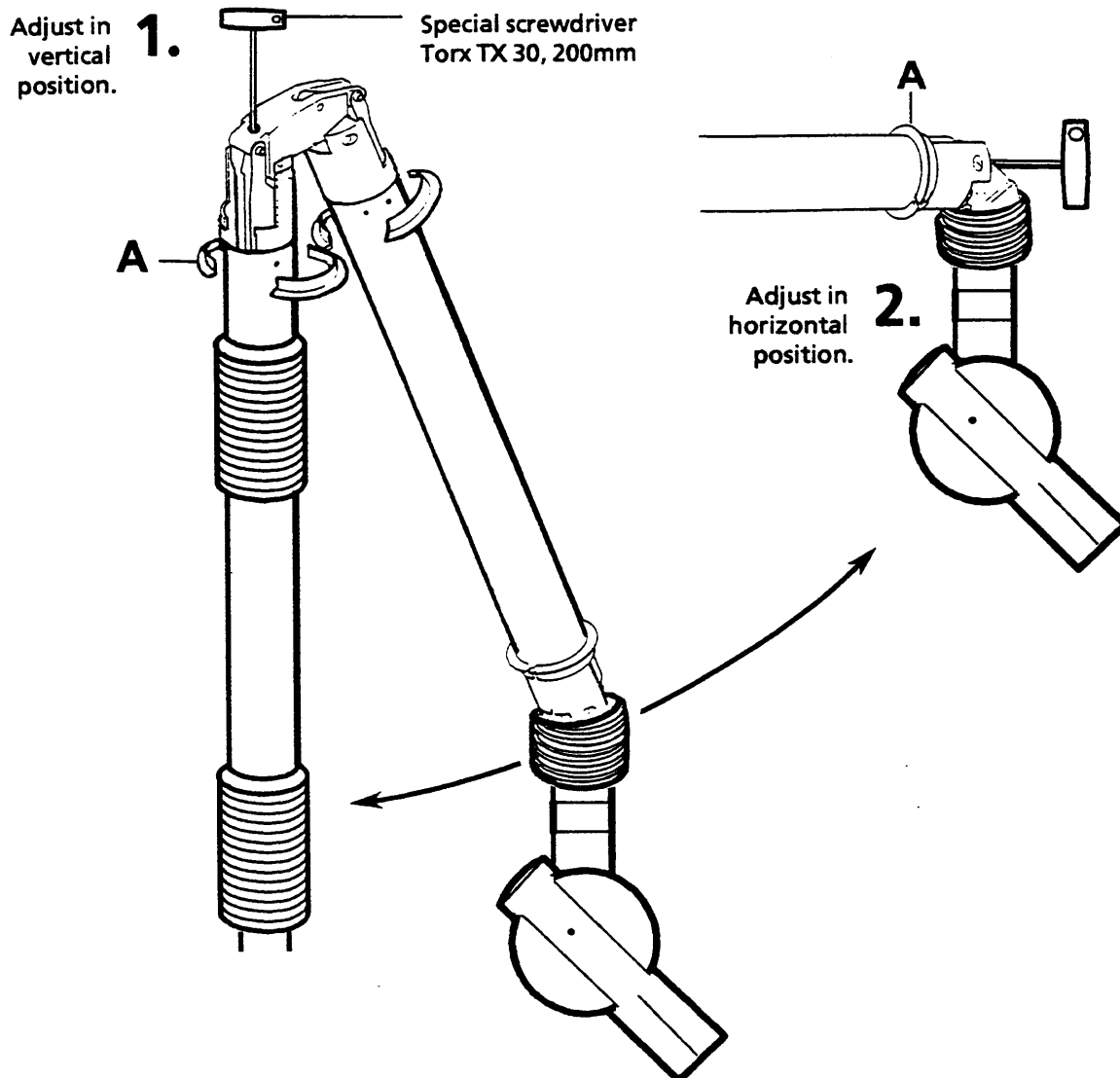
Verification of the Exposure Button

- If door contacts are installed, close door (close contacts), do not bridge contacts.
- Turn unit OFF (WARNING: Electrical shock hazard!)
- Connect multimeter to **DX1 X5.3** and **4**, range for measuring resistance.
- Measure resistance:
 - Exposure button not depressed: **R > 100 kOhm**
 - Exposure button depressed: **R < 100 Ohm**
- The values must remain constant, even if the coiled cable is moved during the measurement.
 - If the values are not present, check correct function of the door contacts.
- If the values are still not present, exchange exposure button.
- Disconnect multimeter.
- Reattach housing (see Service Manual, chapter "**Removing Housing**")



Verification of the Object Selector Switch

- Turn object selector switch (1) to the lefthand stop (turn counter clockwise).
Turn object selector switch (1) clockwise step by step (12 steps) up to the righthand stop, recording the displayed (2) time value for each step.
- Repeat procedure and compare indicated values with recorded values.
- If the values differ between first and second reading: exchange **generator DS.**



Mechanical Adjustments (if required)

Readjustment is necessary, if the tubehead does not remain stationary after being positioned.

1. Adjust spring on left support arm:
 - Slip bellows on both sides over the half shells **A**. Pull the half shells off.
 - Pull the scissors arm apart and push bellows over the bearing. Set both support arms vertical.
 - Insert torx screwdriver from above into the bore of the bearing and adjust the spring (turn clockwise → tighter).
 - Complete again in reverse order.
2. Adjust spring on right support arm:
 - Slip bellows over the upper half shell **A**. Press the bellows down.
 - Bring support arm into horizontal position.
 - Insert torx screwdriver from the front into the bore of the bearing and adjust the spring (turn clockwise → tighter).
 - Complete again in reverse order.

HELIODENT DS



Yearly Maintenance Checklist

Customer: _____ Address: _____

Dealer: _____ Address: _____

Date of original installation: _____ Date of inspection: _____

Report of Assembly FD 2579 # _____

SCHEDULE	Yes	No	Remarks
All manuals are present	<input type="checkbox"/>	<input type="checkbox"/>	
Test instruments as required	<input type="checkbox"/>	<input type="checkbox"/>	

	Manufacturer	Model	Accuracy	Last calibrated
Voltmeter				
mAmeter				
Pulse Counter				

Any mechanical damage noticed	<input type="checkbox"/>	<input type="checkbox"/>	
All labels are present and legible	<input type="checkbox"/>	<input type="checkbox"/>	
All indicator lights are O.K.	<input type="checkbox"/>	<input type="checkbox"/>	
Radiation indicator X-ray lights up, audible buzzer O.K.	<input type="checkbox"/>	<input type="checkbox"/>	
Deadman feature O.K.	<input type="checkbox"/>	<input type="checkbox"/>	
Tube current is within specified limits	<input type="checkbox"/>	<input type="checkbox"/>	Measurement:mA
Specified exposure time (pulses) O.K.	<input type="checkbox"/>	<input type="checkbox"/>	Pulse Count:
Exposure button O.K. Resistance within specified limits	<input type="checkbox"/>	<input type="checkbox"/>	
Object selector switch O.K.	<input type="checkbox"/>	<input type="checkbox"/>	
Mechanical adjustment of the support arm is O.K.	<input type="checkbox"/>	<input type="checkbox"/>	
The unit is in compliance with MFG specified tests and safety	<input type="checkbox"/>	<input type="checkbox"/>	

Technician: _____ Dealer: _____

HELIODENT DS



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We reserve the right to make any alterations which may be required due to technical improvements.

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