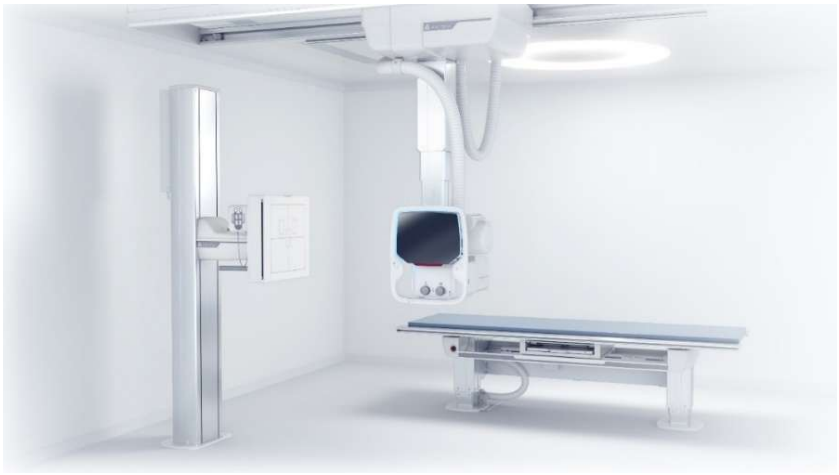
UDI_0073-815-321 Upgrade R221 Collimator

OVERVIEW: The instructions will cover the process of replacing the Optica30 collimator with Ralco R221. It will guide you with the removal/assembly of the DAP chamber, installing the new spacer required with Ralco R221 and lead you through the process of assembling the electrical wiring needed in the Ralco R221.

ESTIMATED TIME: 8h

OBS! Be aware of that in one step in the intruction (Install spacer) you will need one more person to support to prevent damage.

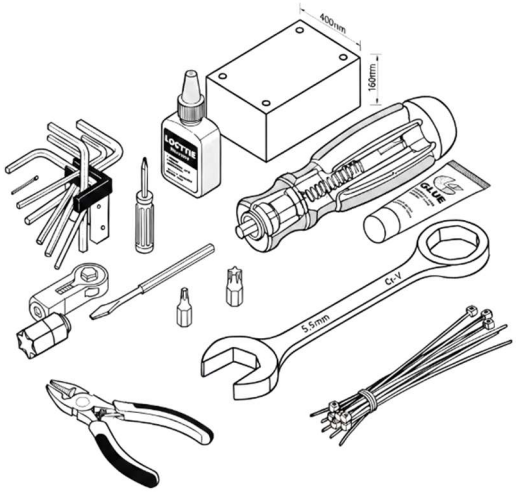
APPLICABLE TO: Precision i5 systems equipped with Optica30 collimator.



KIT P/N : 0073-815-321

TOOLS: Standard Service tools.

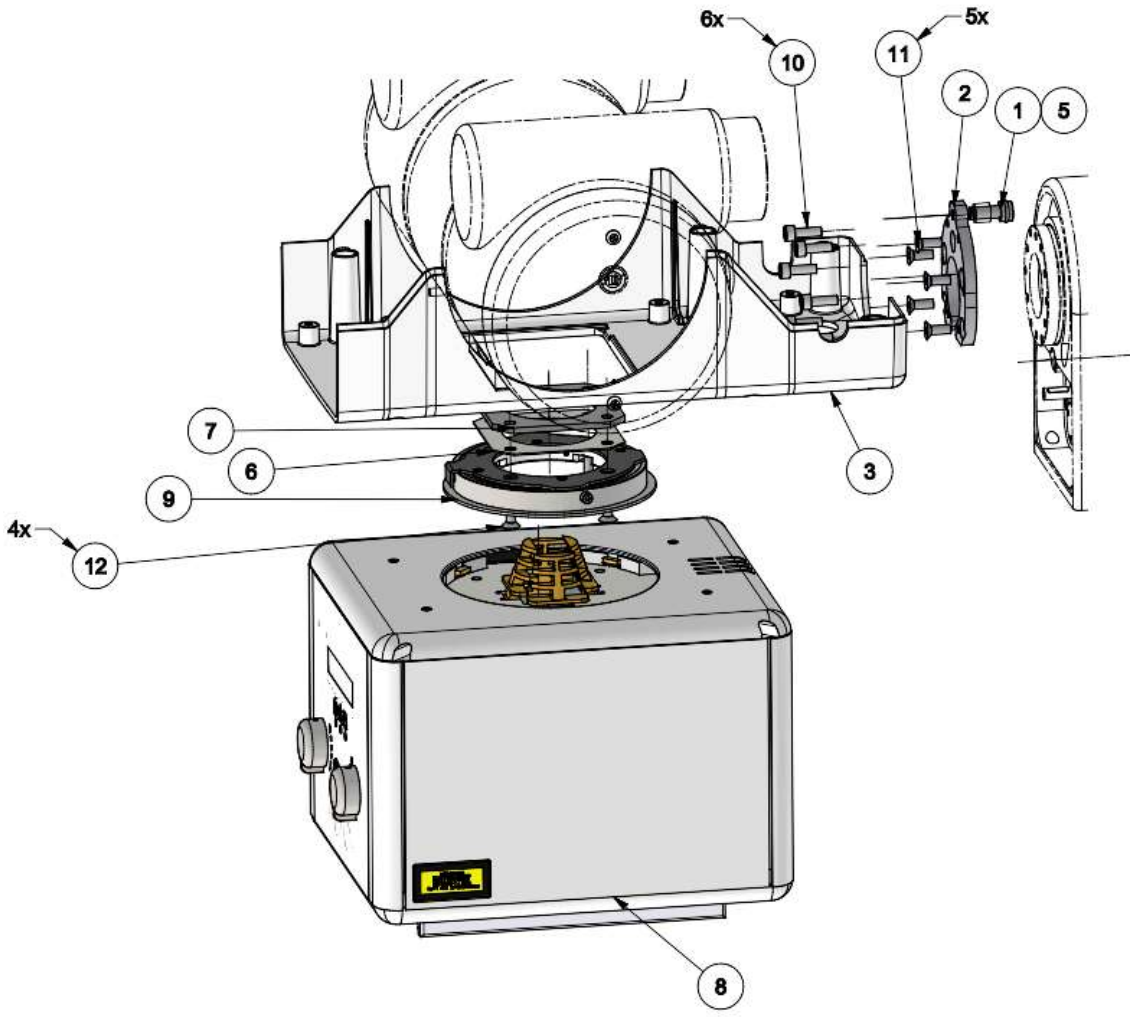
- Ratchet wrench
- 5,5mm wrench
- Torx wrench
- Star wrench
- Allen key set
- Loctite
- Glue
- Support
- Cable tie



PROTECTIVE MEASURES:

CAUTION!
Printed circuit boards contain electrostatic highly sensitive components requiring particular care in their handling. Ground before making contact and place only on a conductive surface.

CAUTION!
Remaining energy may exist when the equipment is switched off. Always wait at least 15 seconds before working on the system.



Check software version

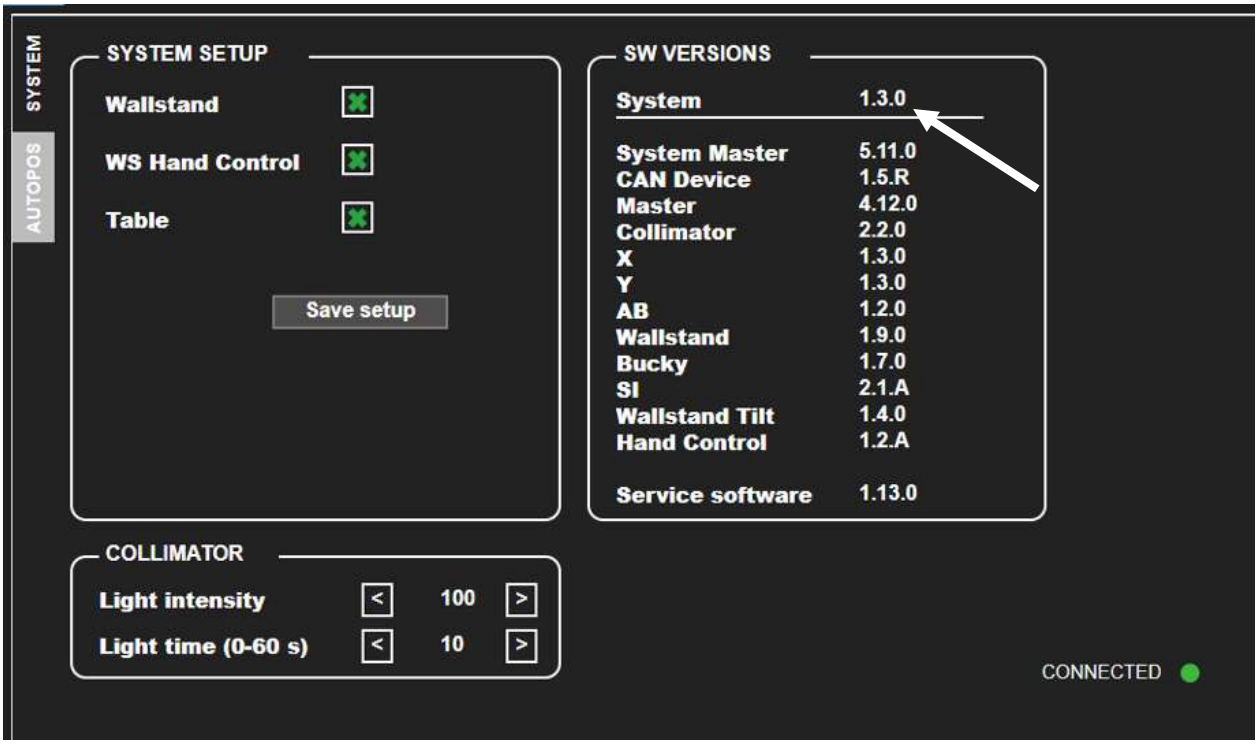
Confirm system current state

1. Check current software version of the system.

2. Press and hold the Settings icon in lower left corner of the display to open the Settings menu.

3. Select the *SERVICE* tab and *SETTINGS* menu. Enter password *1895*.

4. Check and confirm that the System software version is 1.3.0 or higher.



5. The requirement is version 1.3.0. It is recommended to use the latest released version. Upgrade software if necessary.

Hardware upgrade

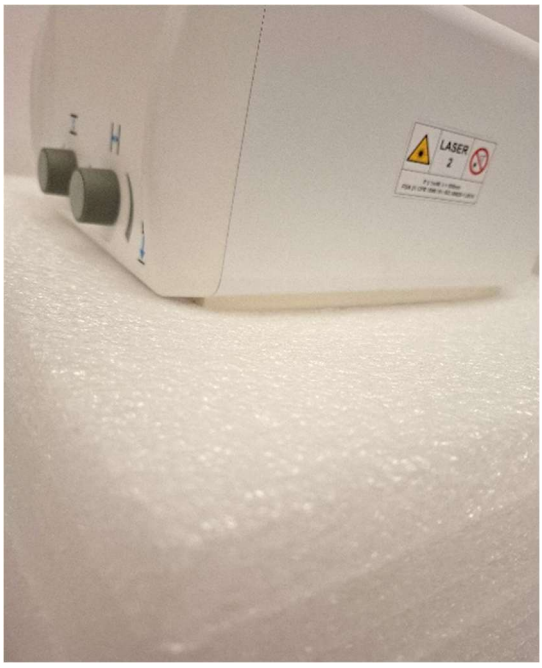
Remove tube covers (top/bottom) and OP30 collimator

6. Remove the six screws for the OTC tube cover.

6.1 Carefully lift the tube-cover off to gain access.

6.2 *Note! To prevent damage to the emergency-stop cable, lift the tube-cover carefully.*

7. Support the OP30 collimator to prevent it from falling.



7.1 Drive either the table or the OTC to rest the OP30 collimator on the support.

7.2 Turn the system OFF from the generator mini console.

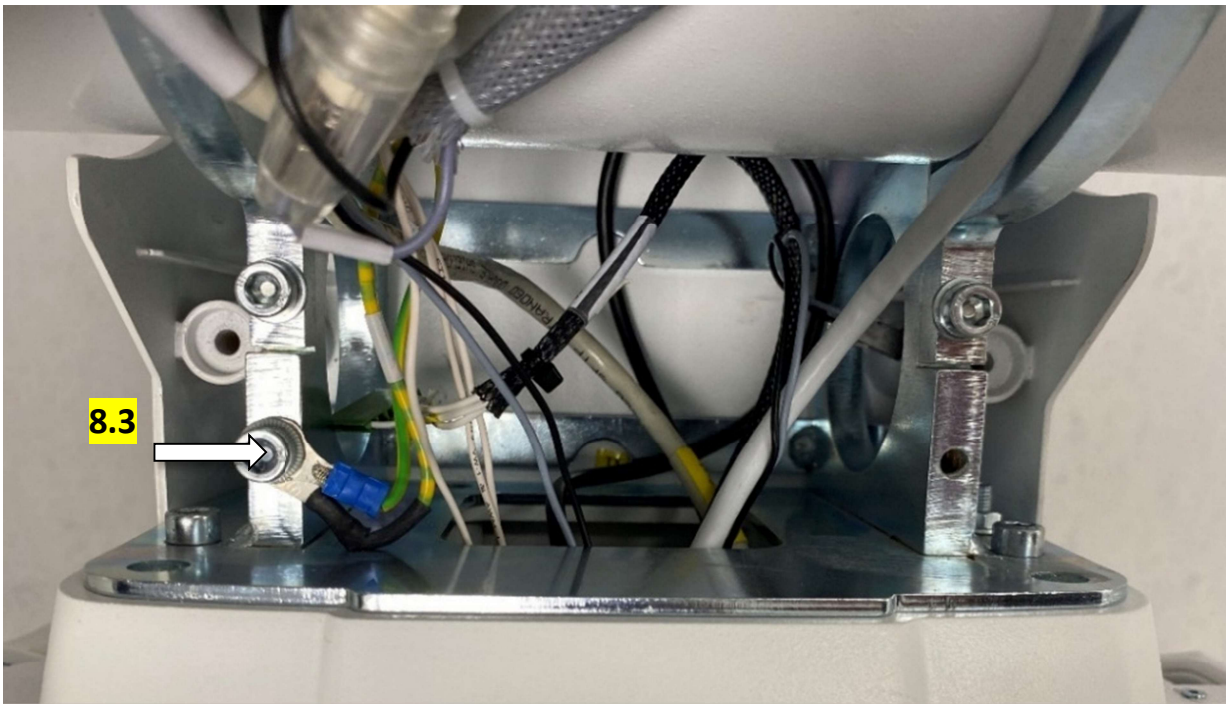
8. Disconnect the wiring belonging to the collimator.

8.1 Collimator cable

8.2 Dap cable

8.3 PE cable

8.4 Camera cable *(OBS! Not available on all systems)*



9. Pull out all disconnected cables from the previous step through the bottom cover.

10. Release the three or four set screws to remove the collimator.

Note! The collimator is supported entirely by these screws and will separate from the OTC when the screws are released. Make sure the collimator is supported to prevent unexpected damage.

10.1 Turn the system ON from the generator mini console.

10.2 Drive either the table down or OTC up to separate the collimator from the flange.

10.3 Remove the collimator including the support.

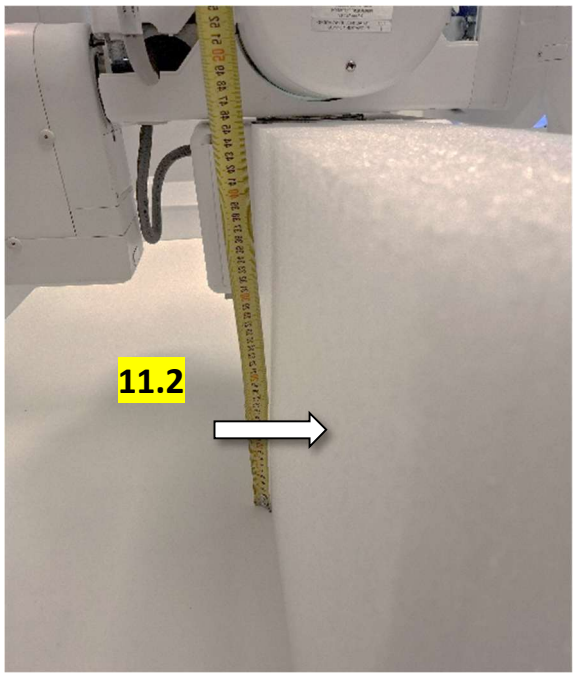
11. Prepare the system for the installation of the new spacer.

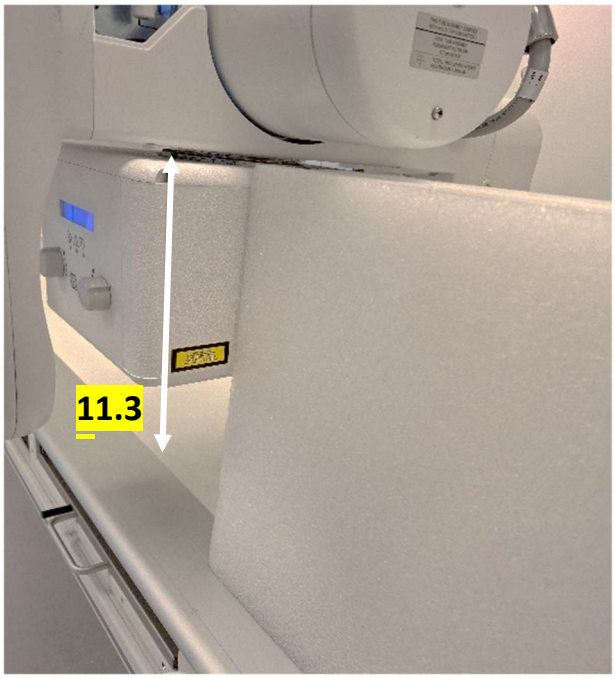
11.1 Place the OTC in a good working position, place the system display outside the tabletop meanwhile the whole collimator is above the tabletop.

11.2 Tube-head support required (<u>at least a height of 350mm</u>)

11.3 <u>Distance between the tabletop and tube head should be equal to the height of the support</u>.

Note! Further into the instructions you will disconnect the emergency stop and not be able to adjust the height between table and OTC. (chapter "Install spacer")

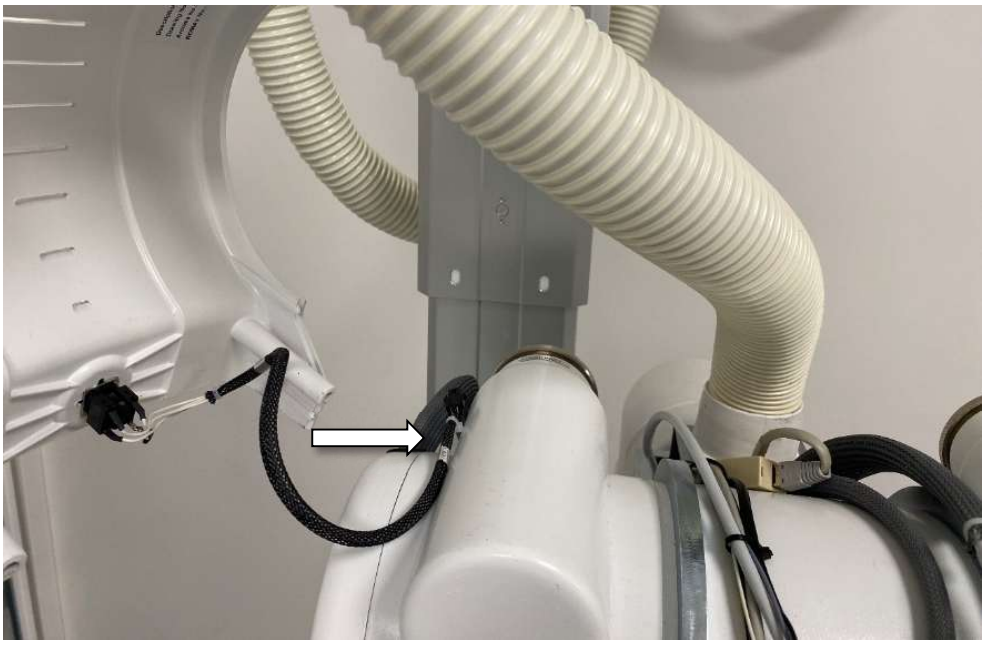




Disregarding the fact that there is a mounted Ralco on the pictures

12. Turn the system OFF from the generator mini console.

13. Disconnect the emergency stop cable 1.3J01 and turn the cover away from the work area. This prevents damaging the emergency stop.

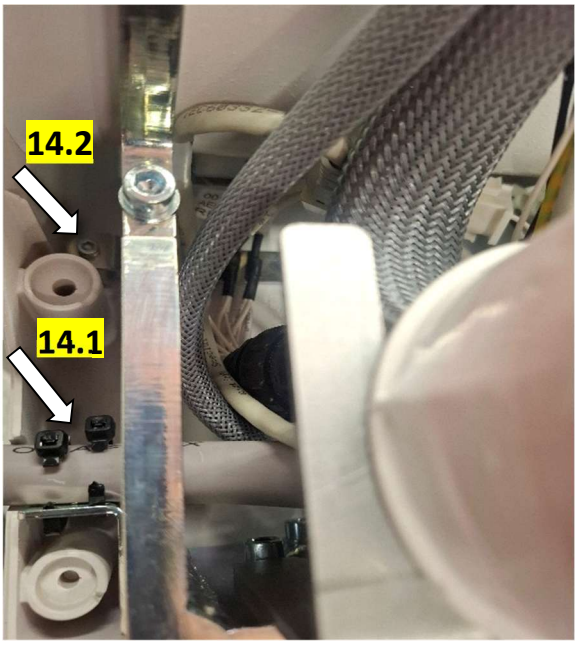


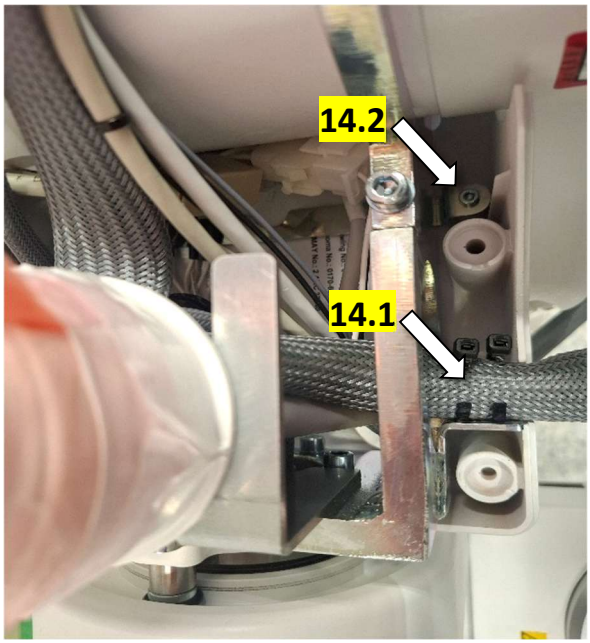
13.1 Remove the OP30 Collimator flange.

14. Remove the eight (8) screws holding the bottom cover (save the screws).

14.1 Cut the ties that secure the HV-cables on both sides.

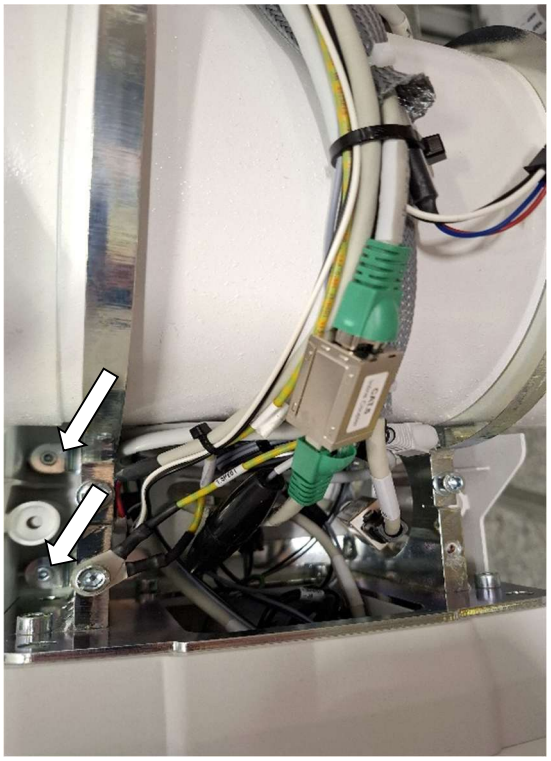
14.2 Remove the four screws located behind the tube. Two of them is located under the HV-cables.





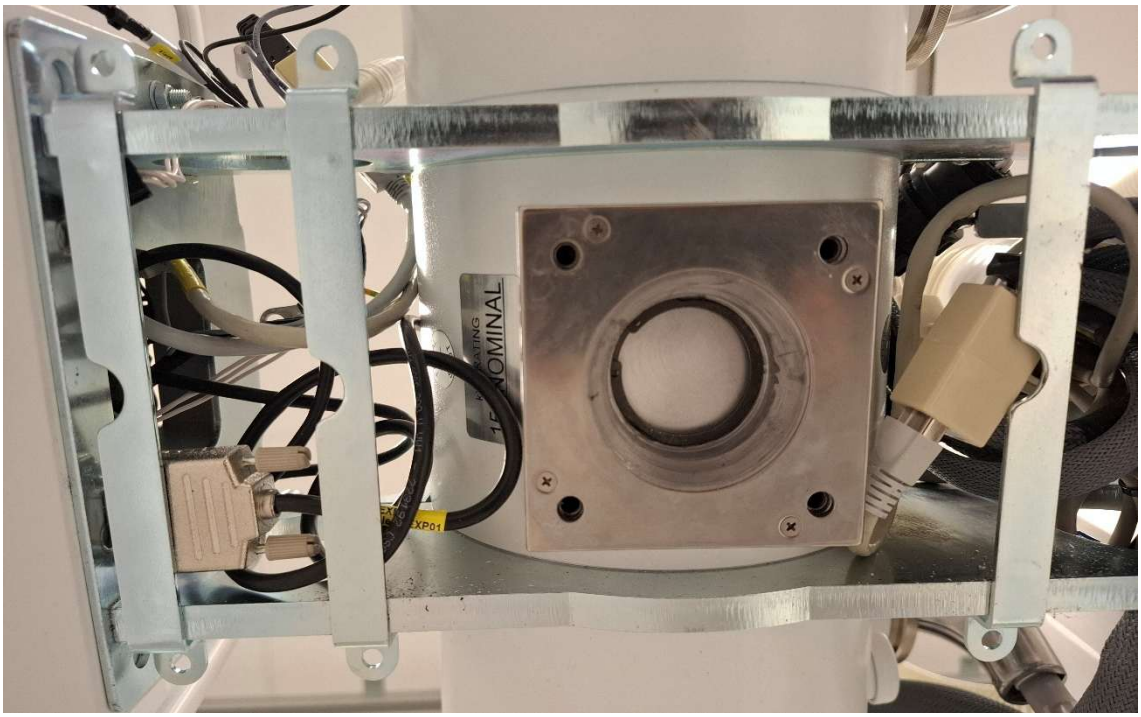
Behind the tube

14.3 Remove the four (4) remaining screws located in front of the tube.



In front of the tube

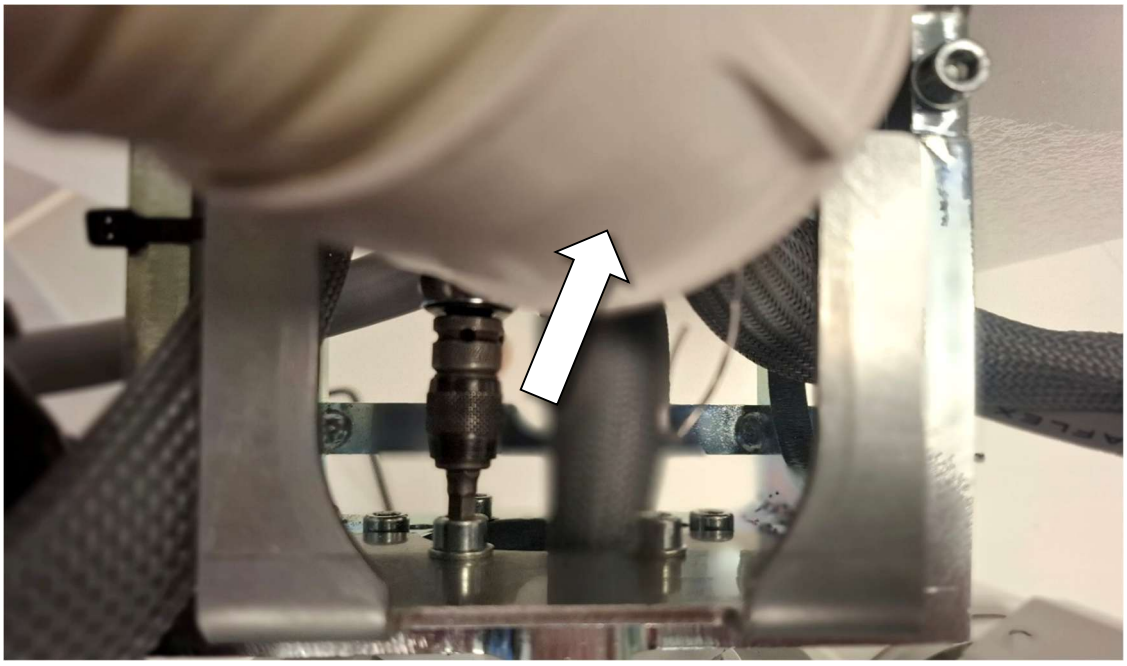
15 Remove the bottom cover, it will not be used after this step.



Bottom cover has been removed

Install Spacer

16. Detach the main wiring out of its support bracket.

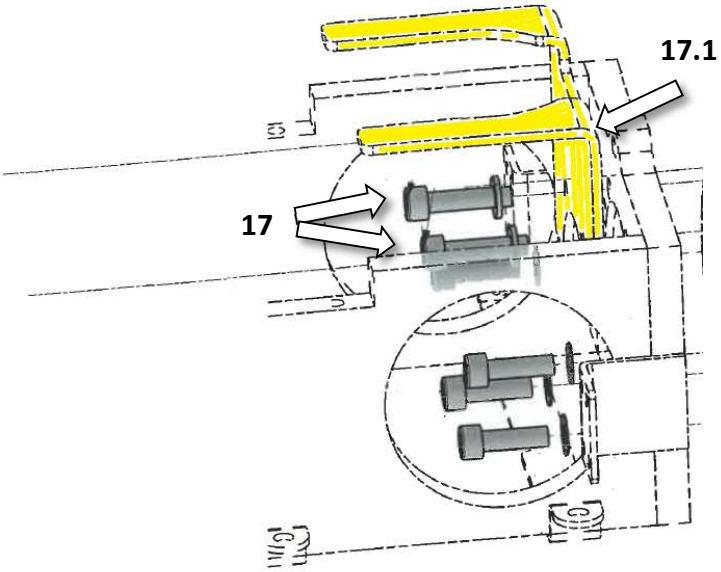


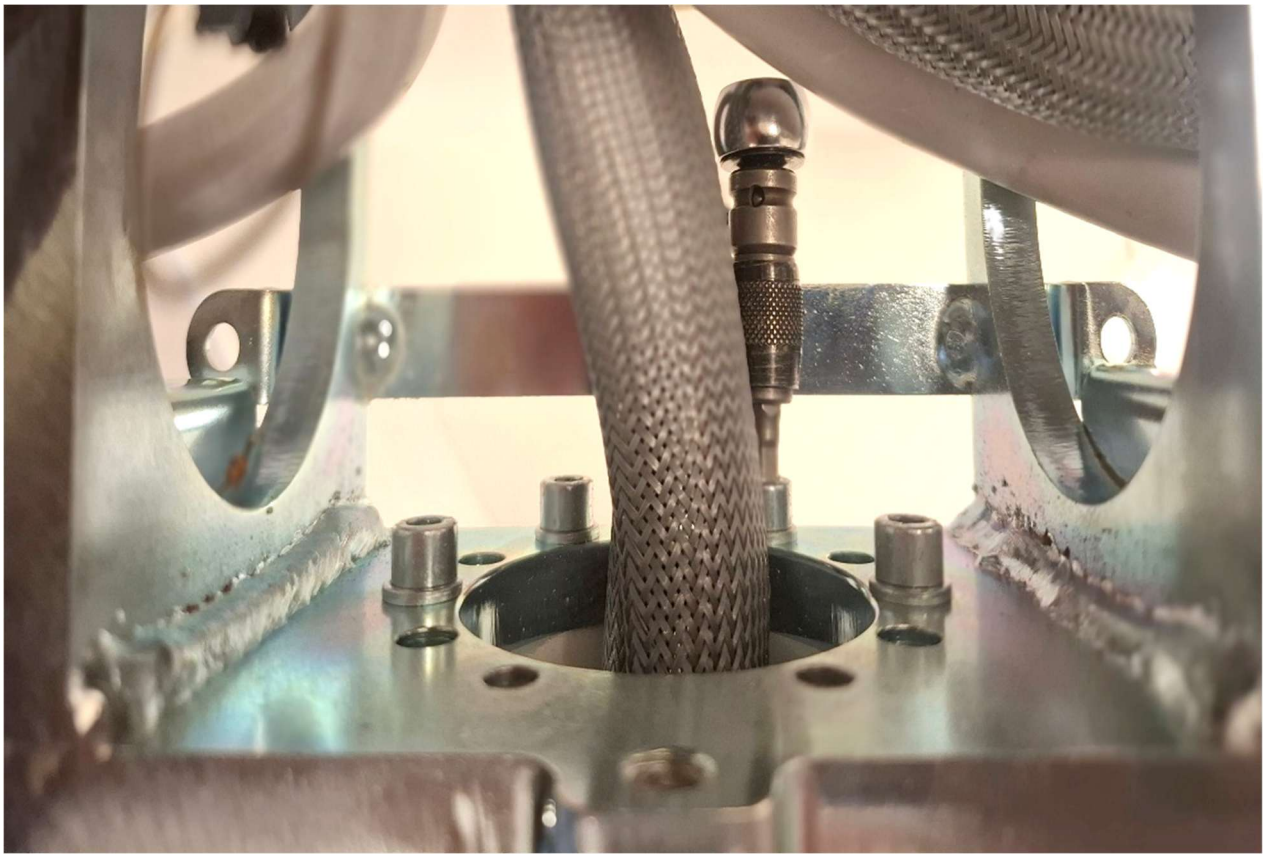
Note! Before removing the last 4 screws. It is required to have support under the tube head. Put the support between the system table and tube head. (see step 11.2)

<u>The following steps require one additional person to hold and support the tube-head.</u>

17. Remove the two screws for the main wiring cable support bracket.

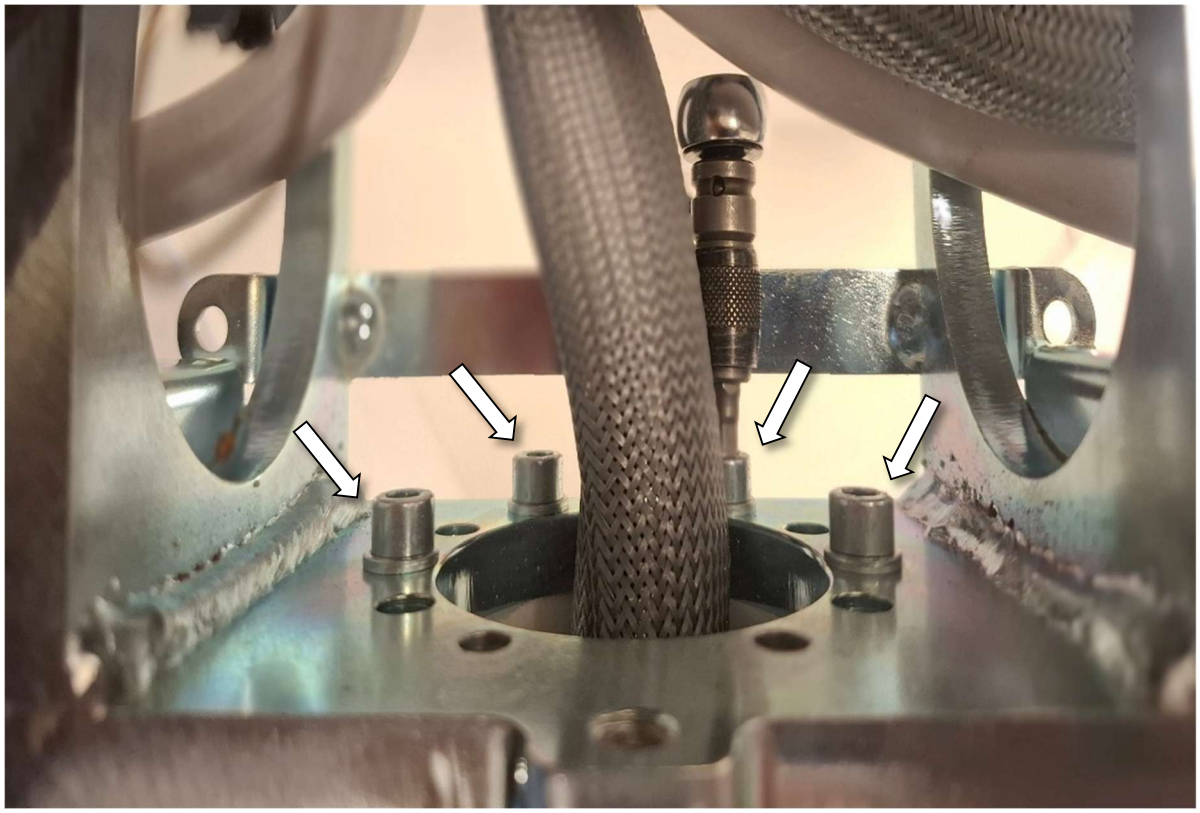
17.1 Remove the bracket.



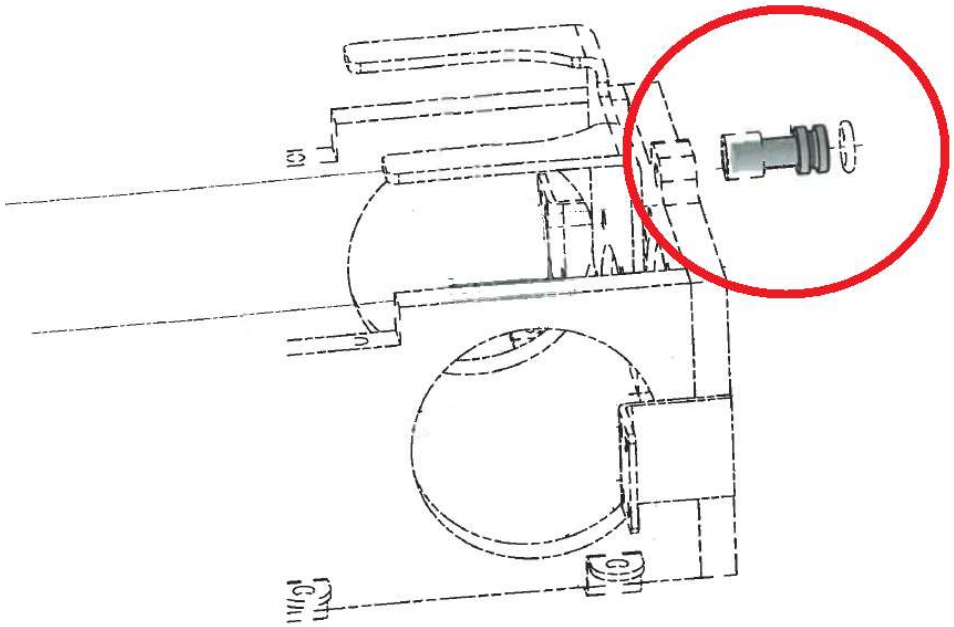


Support bracket removed. Now you can access the remaining 4 screws

18. Release and remove the four (4) remaining MC6S M6.

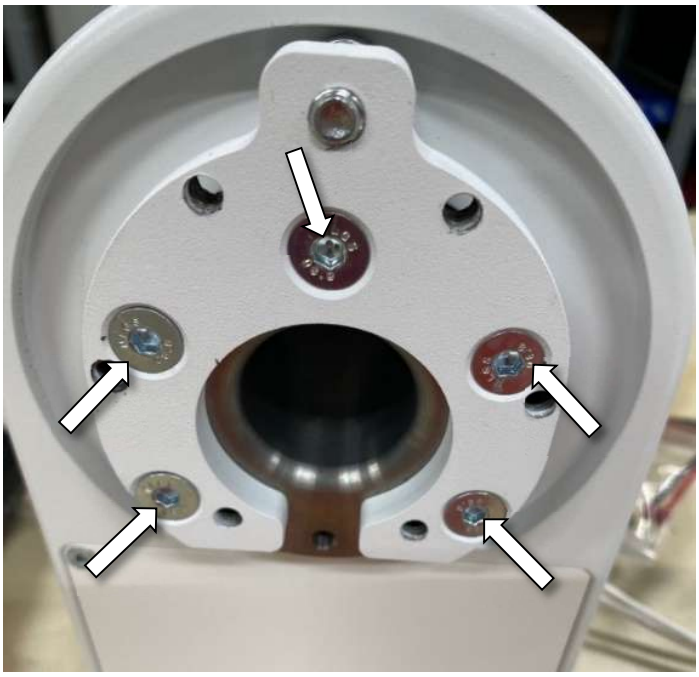


19. Remove the end stop mounted on the cradle. Save it for step 20.



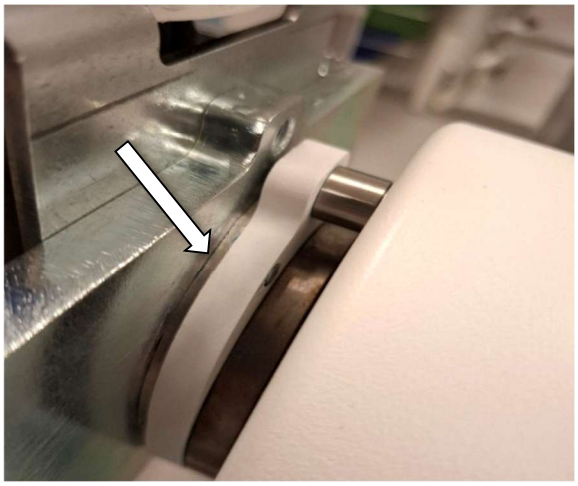
20. Install the end stop removed in previous step on the new spacer.

21. Install the new spacer with (MF6S M6x16) and loctite on the alpha-head.

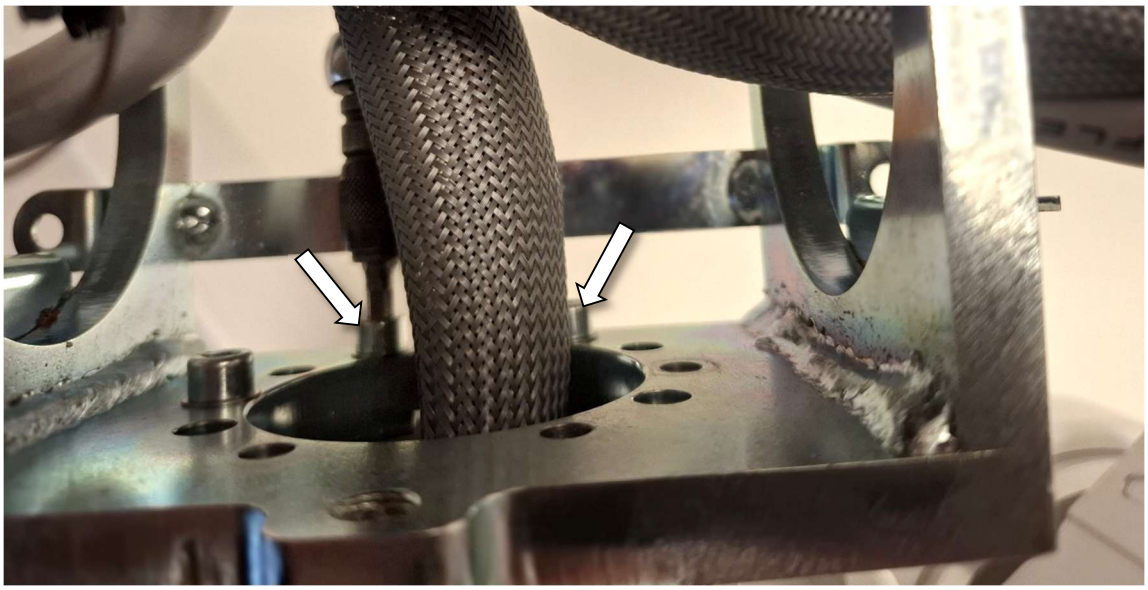


22. Reinstall the cradle against the alpha head.

22.1 Align the existing 2mm spacer with the new spacer from step 21. Note that the hole pattern will only match in one way.



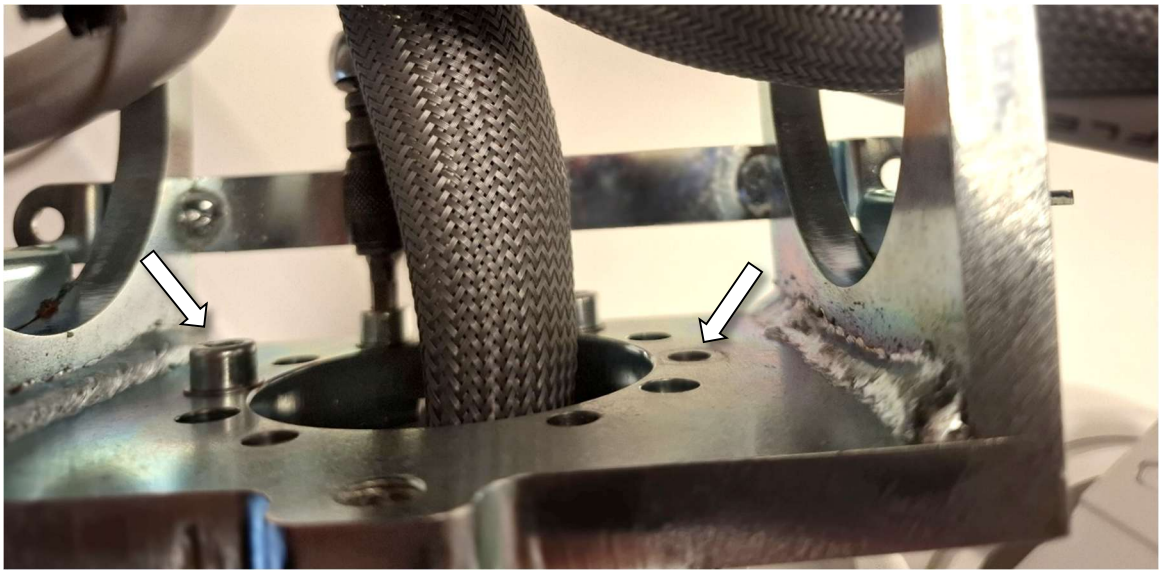
22.2 Insert two screws (M6x20 + P6x12x0,5) through the cradle, the once that should be in the bottom of the cradle



22.3 Thread the 2mm spacer onto the screws in the correct holes.

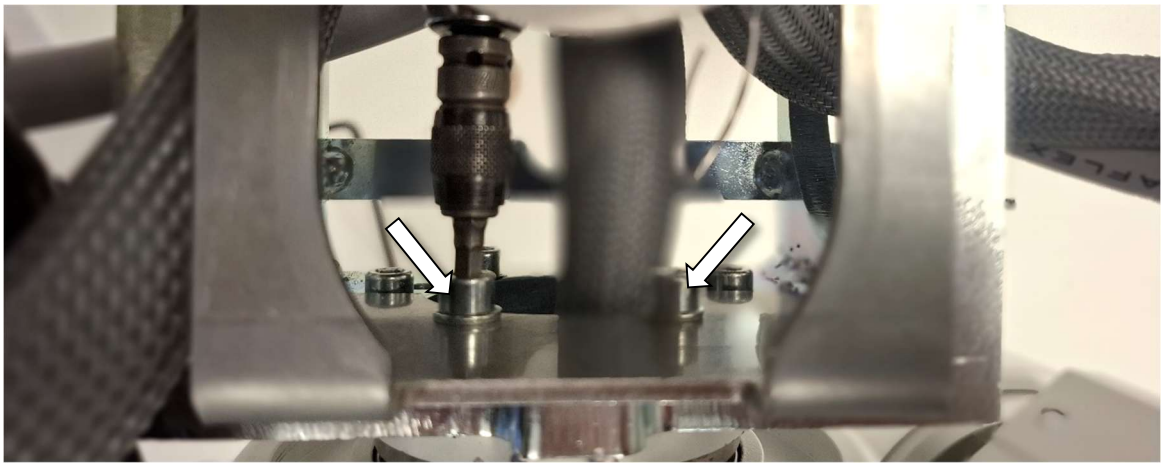
22.4 Tighten the screws (M6x20 + P6x12x0,5) with the new spacer, then 2mm spacer is in between.

22.5 Install the two screws in the middle. (M6x20 + P6x12x0,5)

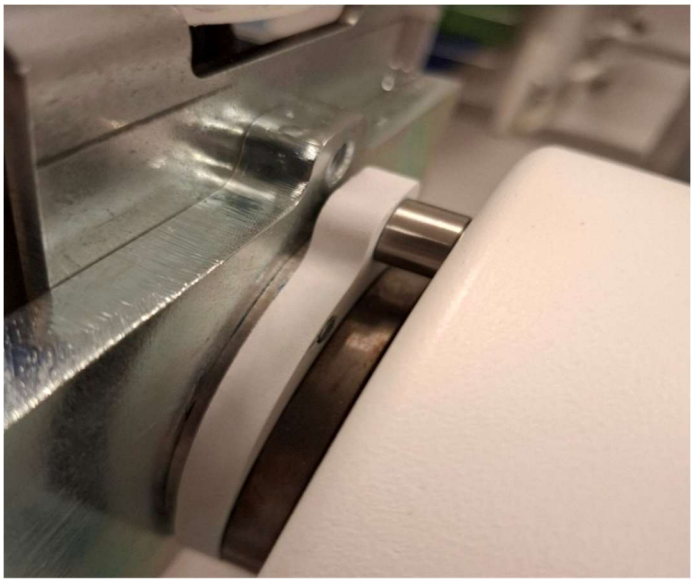


22.6 <u>Remove one screw at a time to apply Loctite</u>.

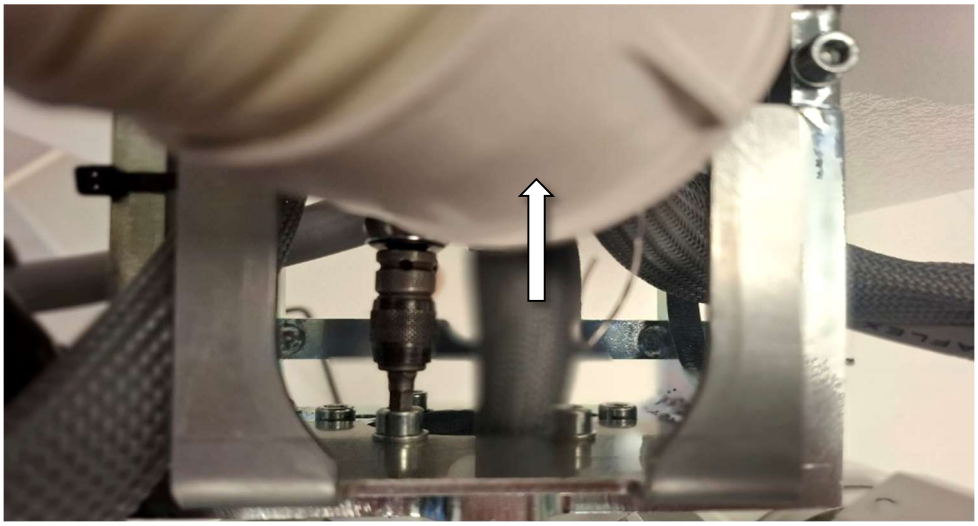
22.7 Install the main wire support with two screw and Loctite. (M6x25 + BRB FZB)



At this point the installation should look like this

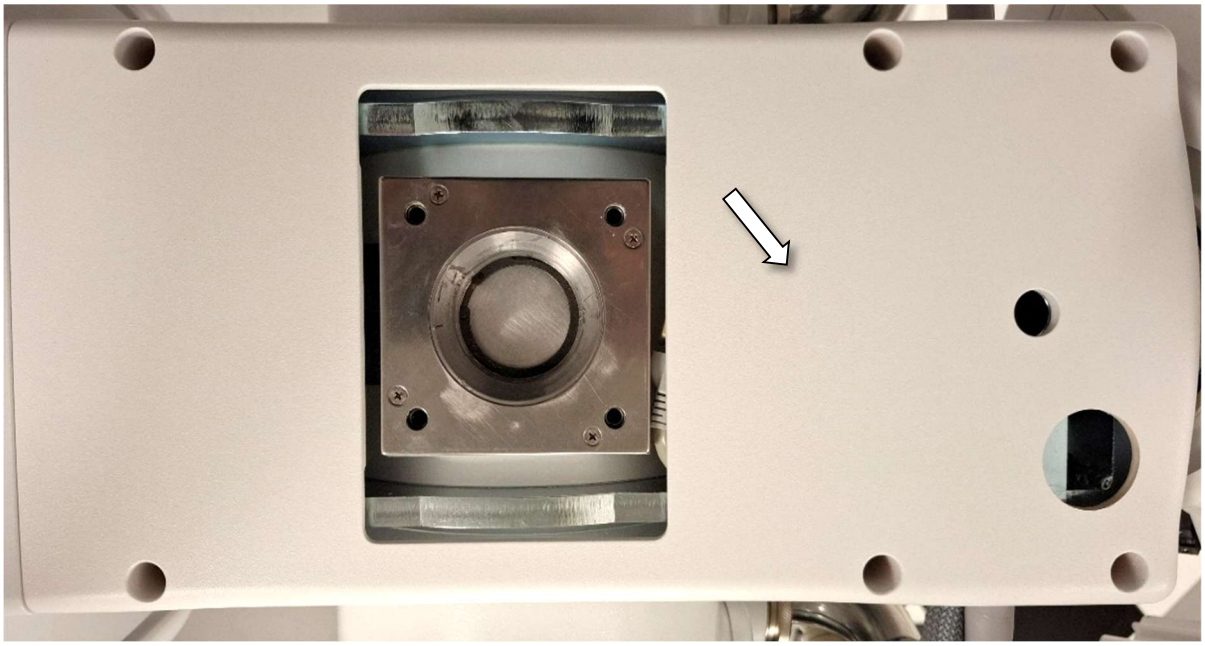


22.8 Reassemble the main wire to the support bracket

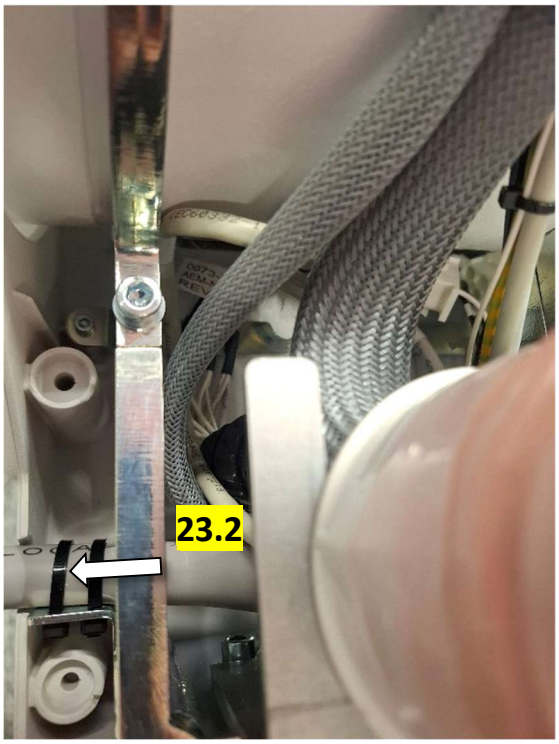


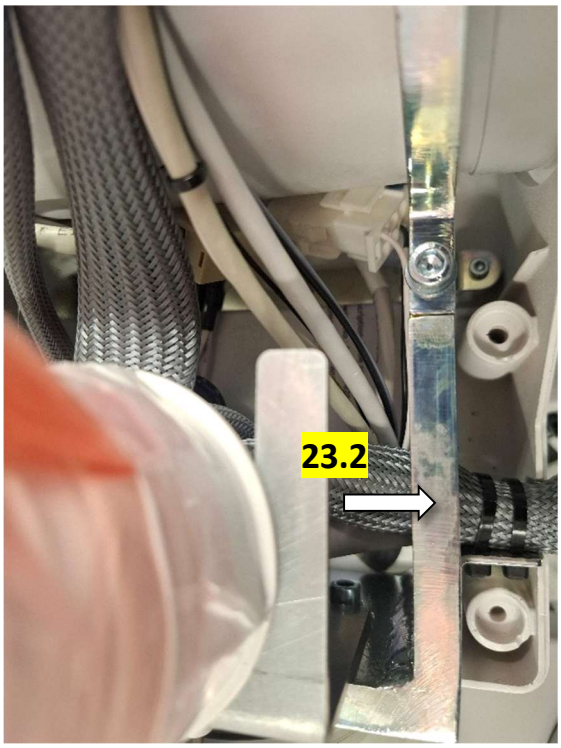
23. Attach the clip guard to the new lower cover.

23.1 Mount the new lower cover for the cradle. Use the screws removed in step 14.



23.2 Reinstall the cable ties around the high-voltage wiring.

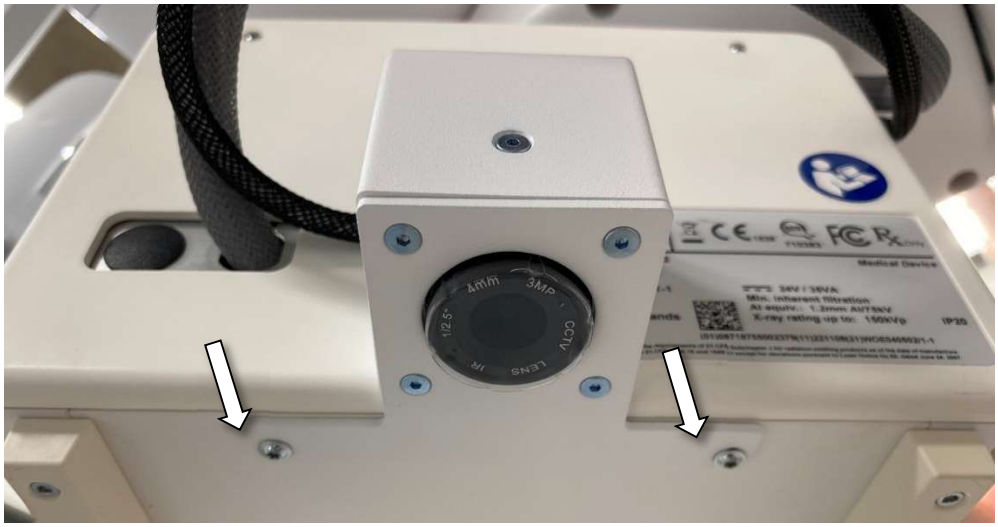




Remove DAP from OP30

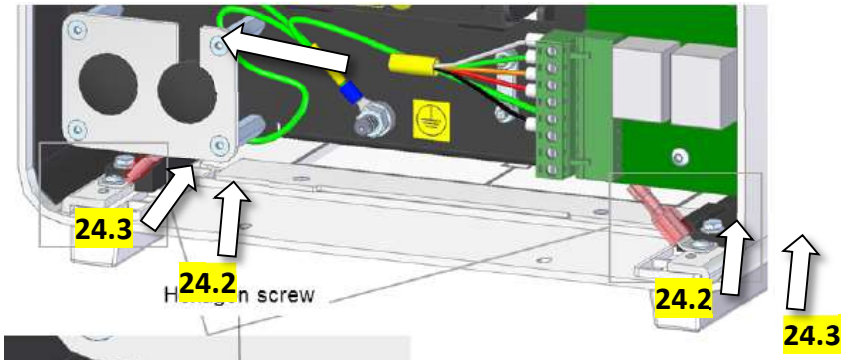
24. Release and remove the four screws holding the back-cover of the OP30 collimator. In case the system is equipped with a patient view camera (optional), remove it as well.

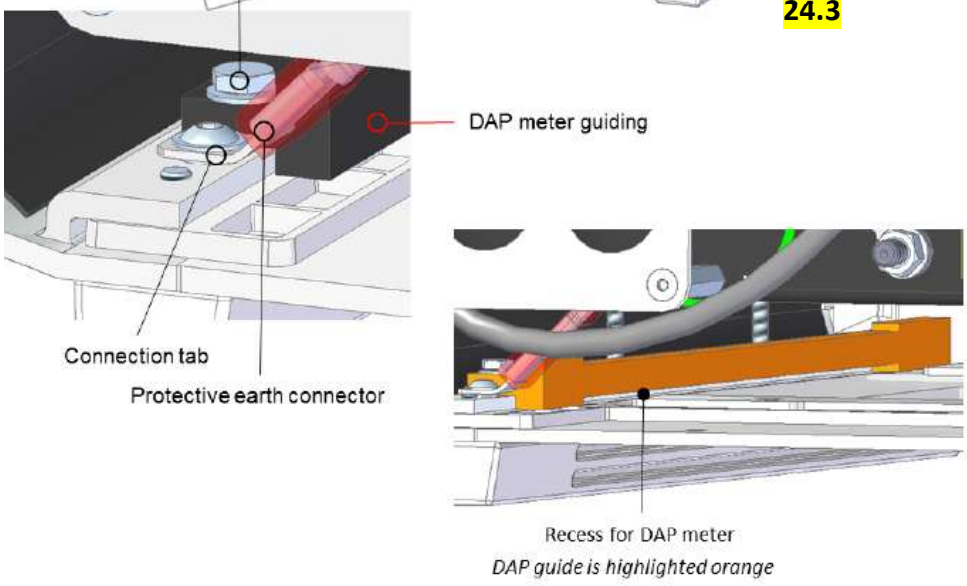
24.1 Remove the bottom screws holding the back cover.



24.2 Disconnect both Protective earth (PE) connectors

24.3 Loosen the hexagon screws approximately three (3) turns. Wrench size is 5,5mm.





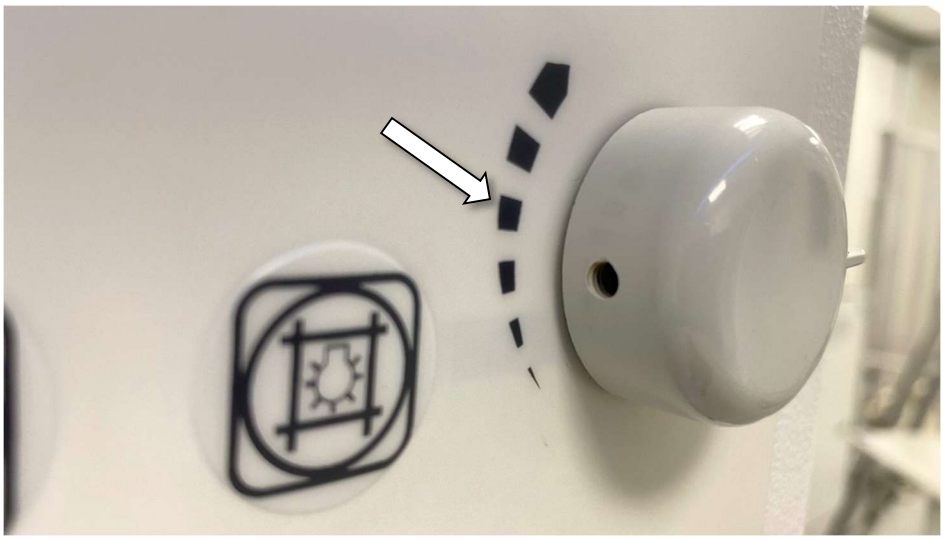
24.4 Carefully lift the DAP-meter guiding and pull the DAP chamber out.

24.5 Save the DAP chamber. It will be installed in the new collimator later.

Preparing Ralco R221 Collimator

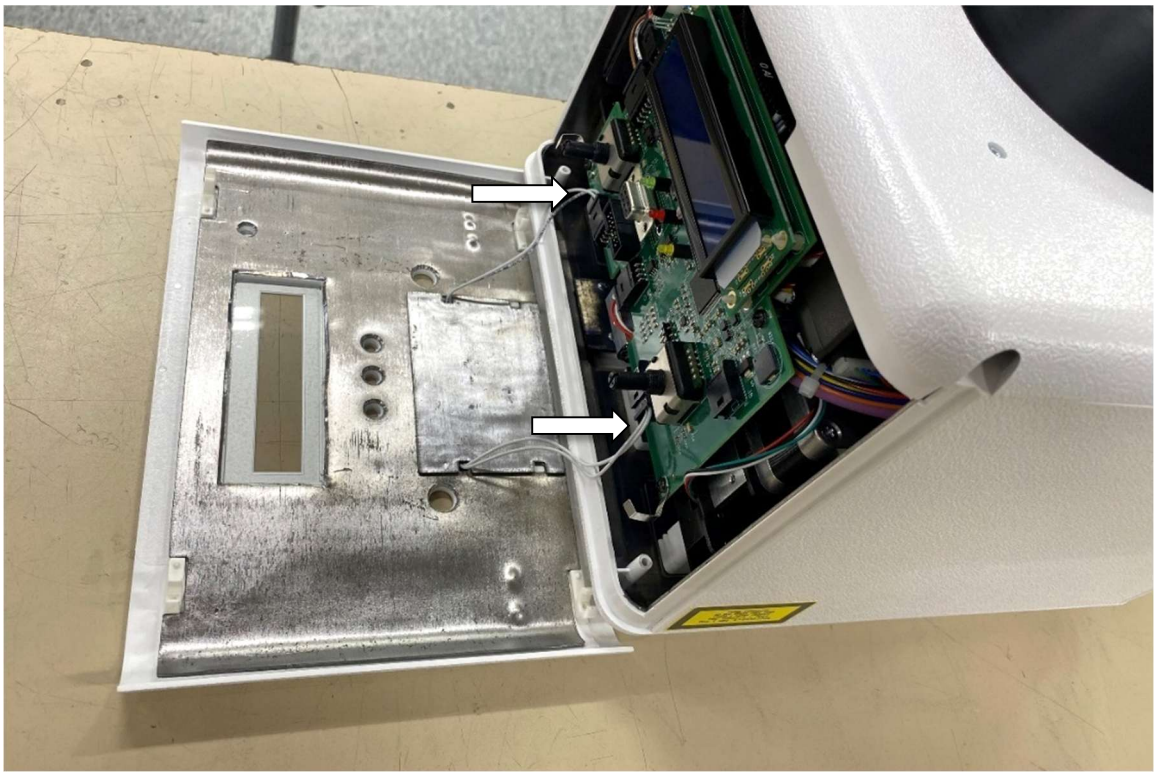
25. Place the R221 collimator on a workbench.

25.1 Release the grub screws and remove the two knobs from the front cover of the collimator.



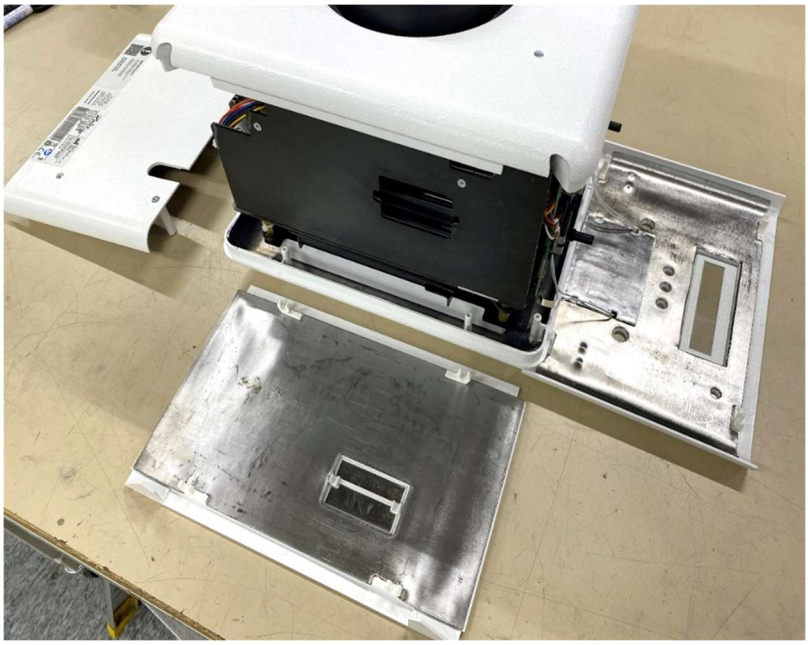
25.2 Pry off the front cover. Be careful with the cables from the front cover to the collimator Main Board.

25.3 Disconnect the cables from the main board.



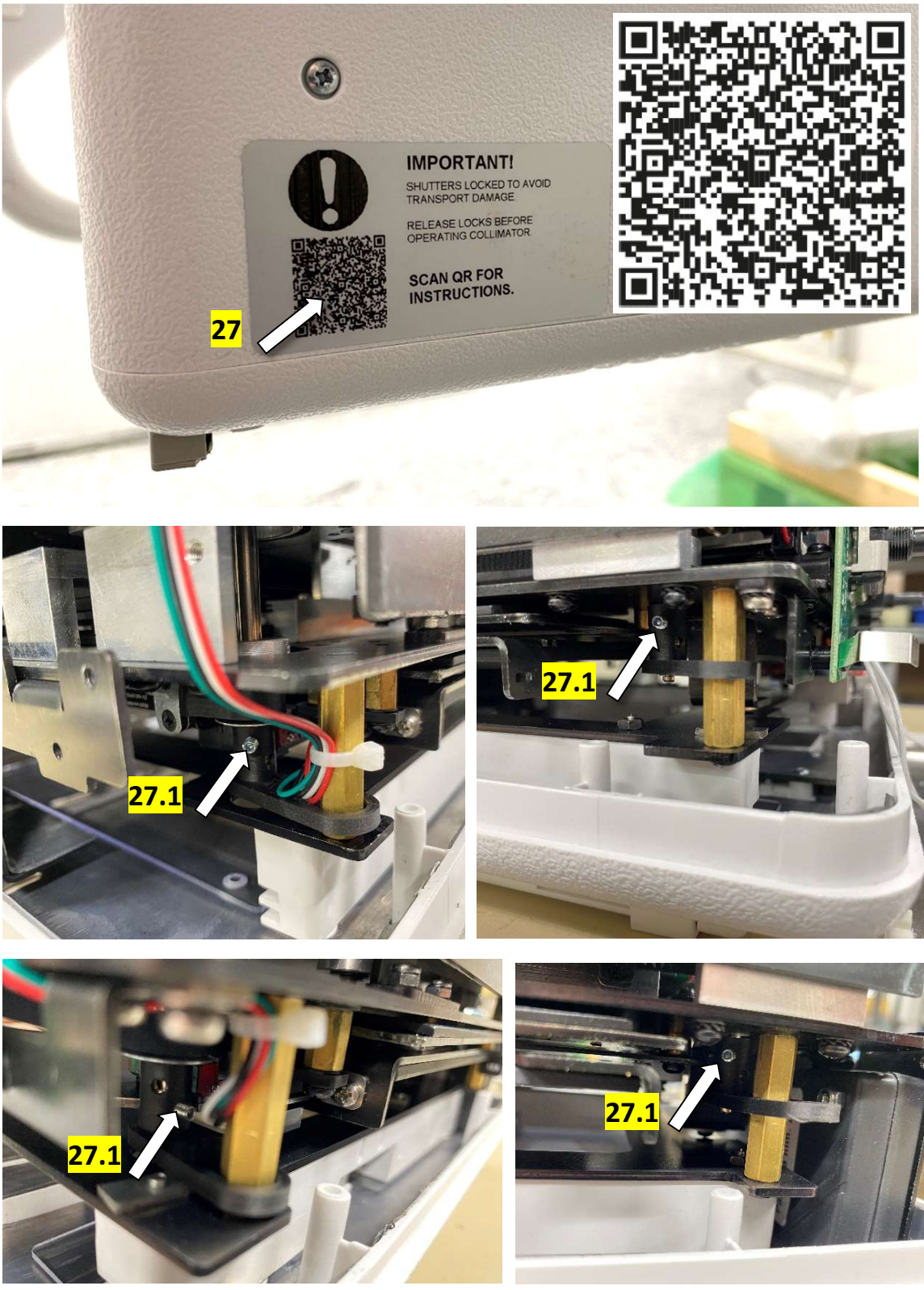
26 Remove the rear cover.

26.1 Carefully pry off both side covers.



27 Scan the QR code on the back of the R221 collimator and download the instructions to release transportation shutter locks. Transportation locks must be released before operating the collimator.

27.1 Losen the transportation locks.



Images of transportation locks to release

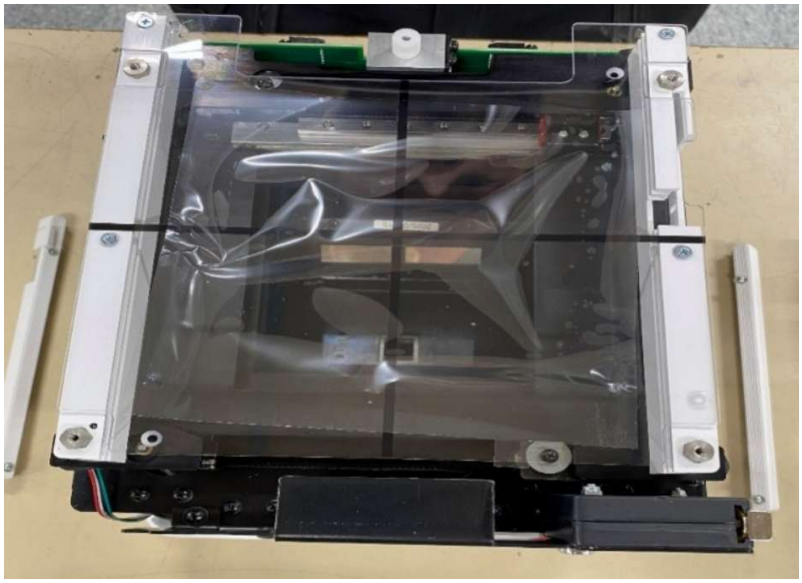
28. Turn the collimator upside down on the workbench.

28.1 Release and remove the four (4) screws for the accessory rails. Remove the rails.

28.2 Remove the plastic bumper of the measuring tape.

28.3 Lift off the bottom cover carefully. Unhook the measuring tape end from the cover.

28.4 Remove the cover.

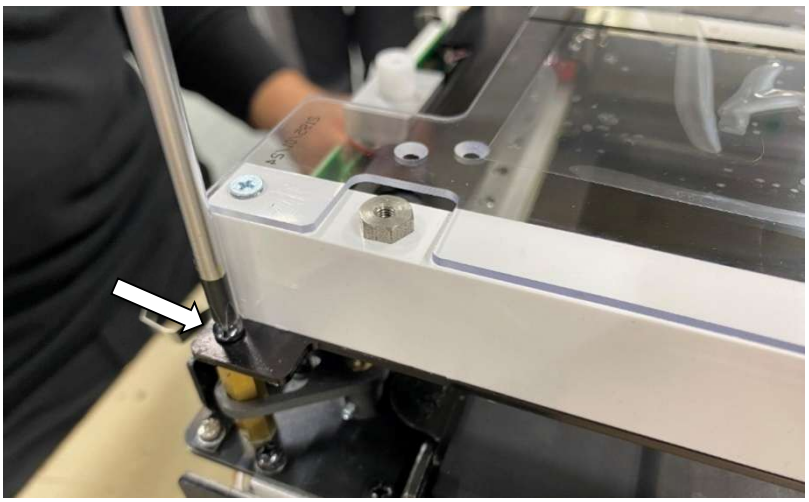


Bottom cover removed

29. Remove the DAP chamber from the original OP30 collimator (step 24). It will be installed in the new R221 collimator in the next steps.

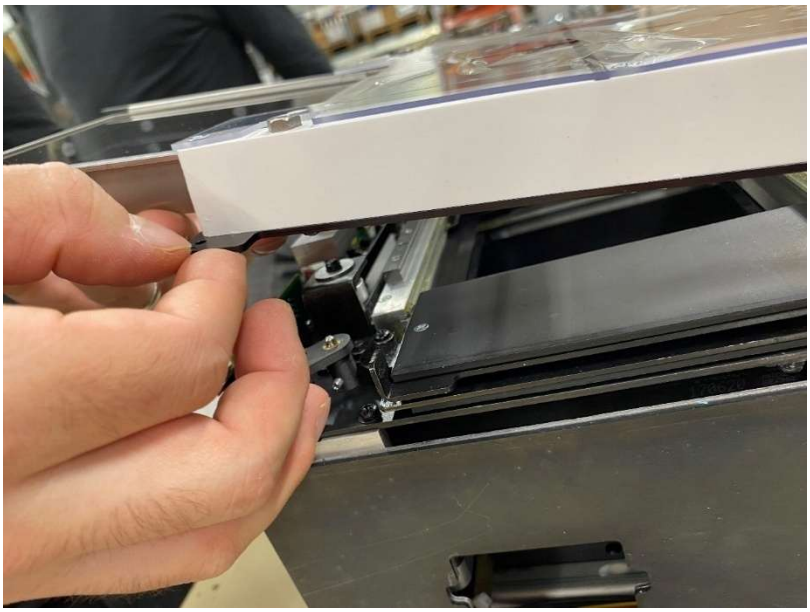
29.1 The DAP chamber that was uninstalled from the OP30 collimator in an earlier step (24), already have rails mounted but you may need to change the assembly. See pictures below and make sure the rails are correctly mounted on the DAP chamber.

29.2 Release and remove the two (2) screws in the front.

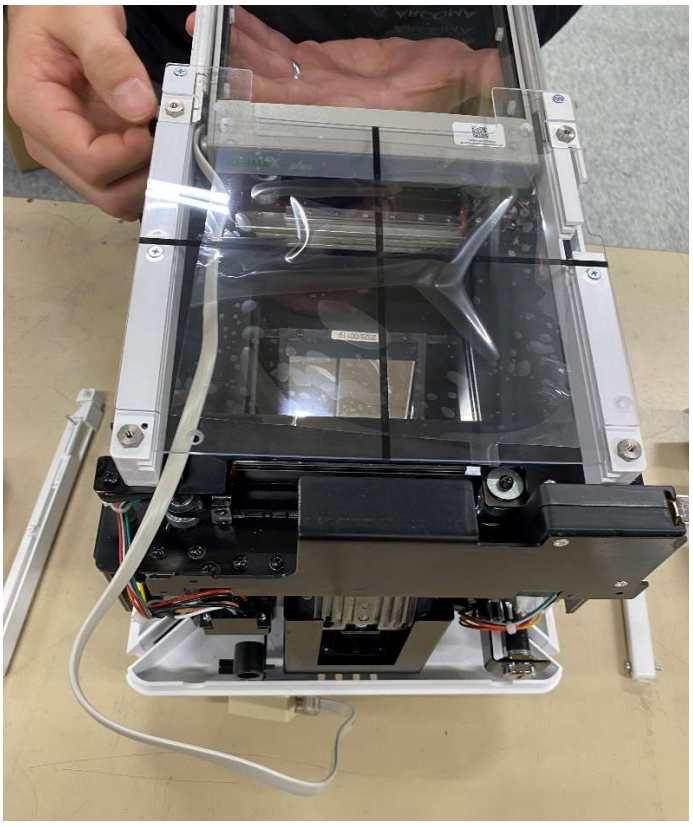


29.3 Release the two (2) corresponding screws in the back of the collimator.
A few turns are enough.

29.4 Carefully lift the assembly to gain space for the insertion of DAP chamber without affecting the laser adjustment.



29.5 Route the DAP chamber cable and then Slide in the DAP chamber rails in the upper track of the collimator. Push it all the way towards its end position.



29.6 Secure the DAP chamber with one MC6S M3x14 screw (Included with the upgrade kit).

30. Reassembly everything from step 28 but now in reversed order.

Wiring Installation Ralco R221

31. In case you completed chapter “Prepare Ralco R221 Collimator” jump to 31.3.

    31.1 Remove carefully all four sides of the Ralco R221 (acc. to chapter “Prepare Ralco R221 Collimator).

    31.2 Lose all four screws to the shipping lock (acc. To chapter “Prepare Ralco R221 Collimator).

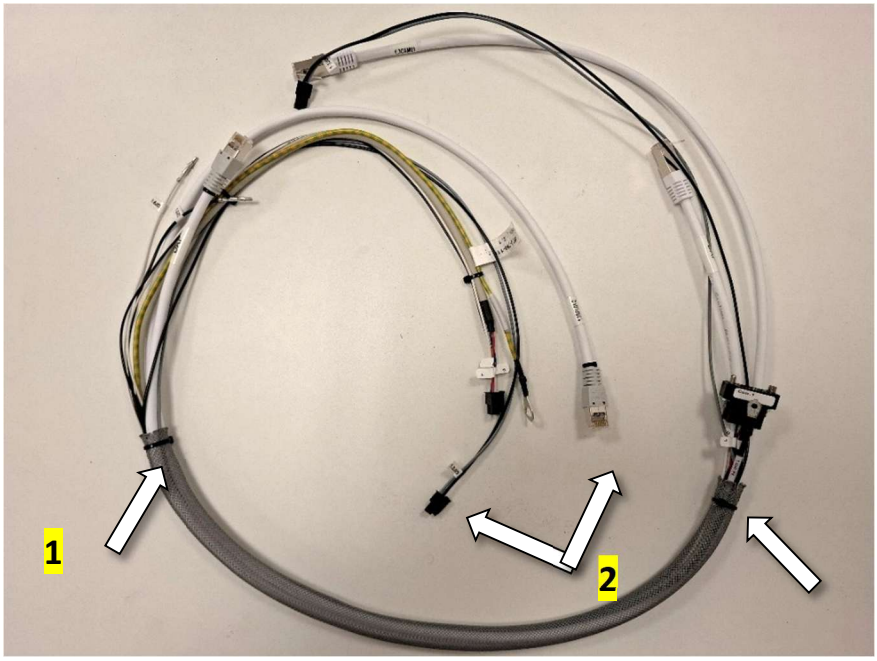
    31.2 Remove the top cover to easily access the strain relief.

31.3 Check if your system already has cables 1.3J08 and 1.3CAM01, in that case you need to adjust the length of these two cables.

1. Cut the cable ties on both sides.

2. Carefully pull the cable 1.3J08 and 1.3CAM01 from the opposite side where the connector COM.1 is located.

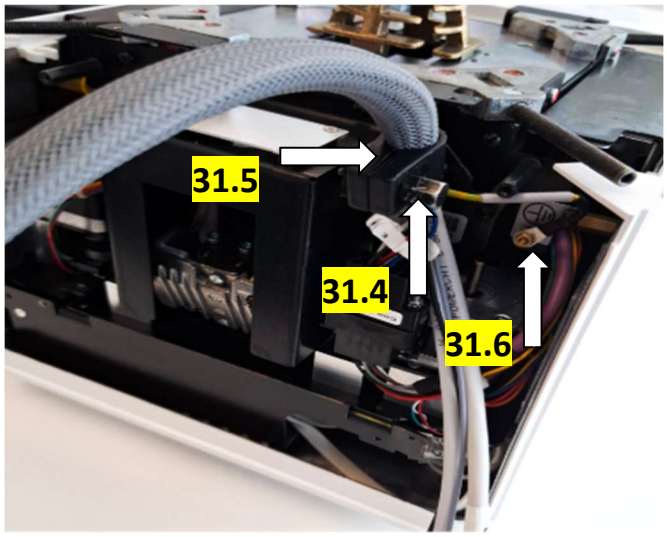
3. Reattach the cable ties.



31.4 Remove the screw holding the strain relief

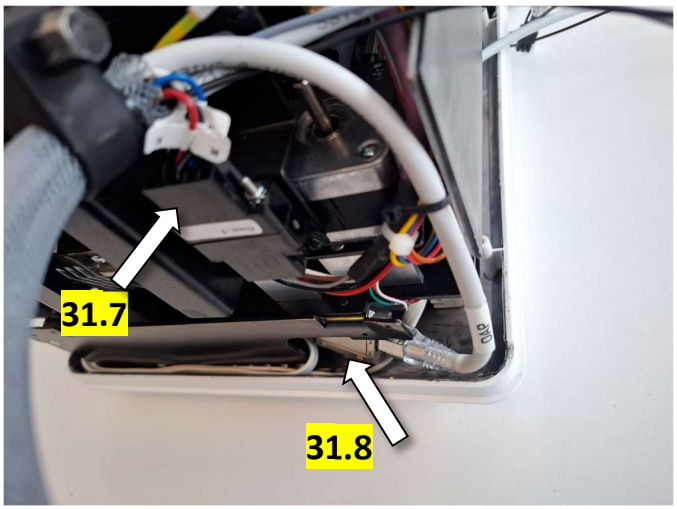
31.5 Install the new wiring in the strain relief

31.6 Secure the ground-wire (PE)



31.7 Insert the connector COM 1.

31.8 Route the Dap cable as shown and connect it to the RJ45 connector.

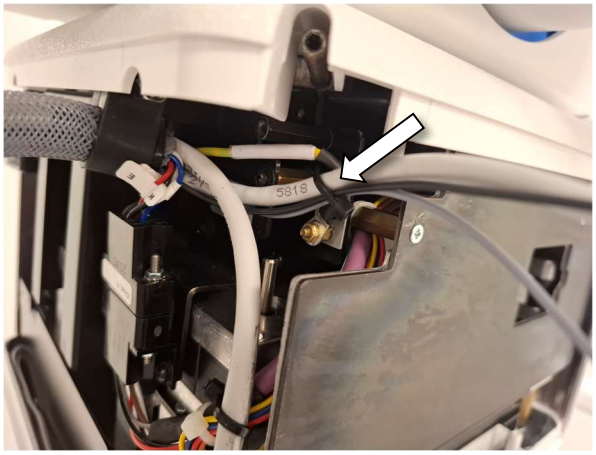


31.9 Remount the top cover of Ralco R221.

32. Reassemble the collimator covers

OBS! Wiring already prepared for 3D camera and has two extra cables. In case you are <u>not</u> upgrading to 3D camera jump to 32.2

32.1 Mount the side covers of the collimator, secure the PE and RJ45. (jump to 32.3)



32.2 Reassemble the side covers.

32.3 Reassemble the front cover.

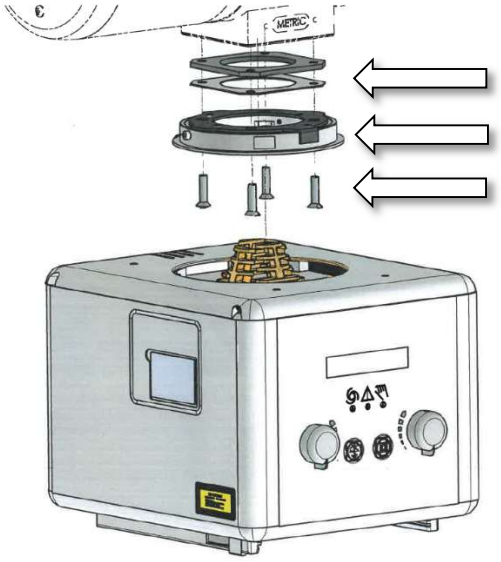
32.4 Reassemble the rear cover.

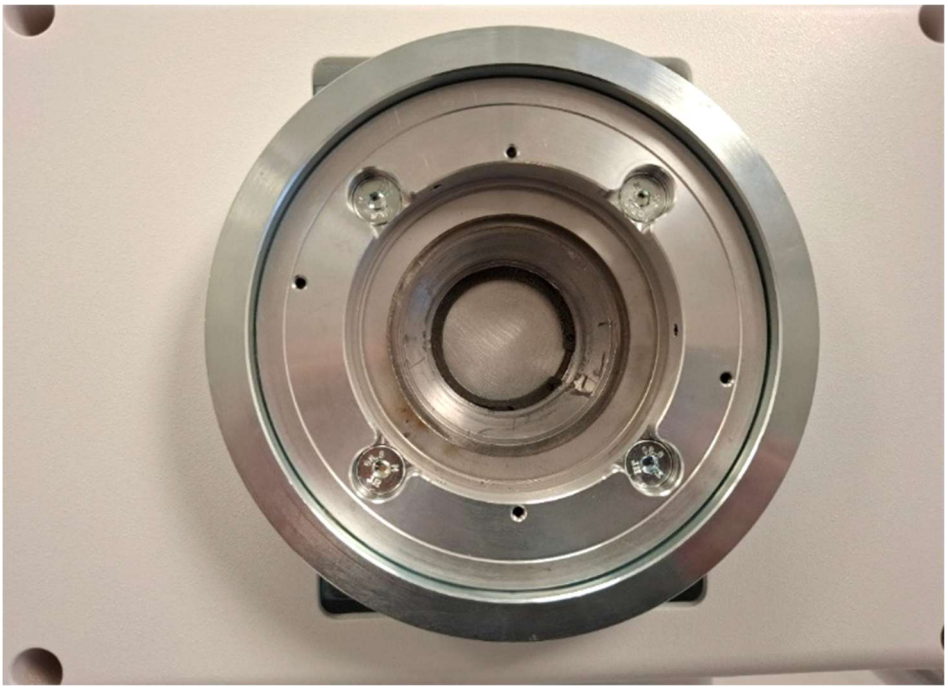
Installing Collimator to OTC

33. Mount the rotating flange on the tube bracket using four screws (MF6S M6x25).
Tighten torque 10Nm, use Loctite 243 or equivalent.

33.1 *Note! Be aware that you pick correct spacer/spacers between the flange and tube bracket. In this case 4mm + 1mm.*

33.2 *Note! Make sure you mount the end stop pointing to the front of the Ralco R221.*



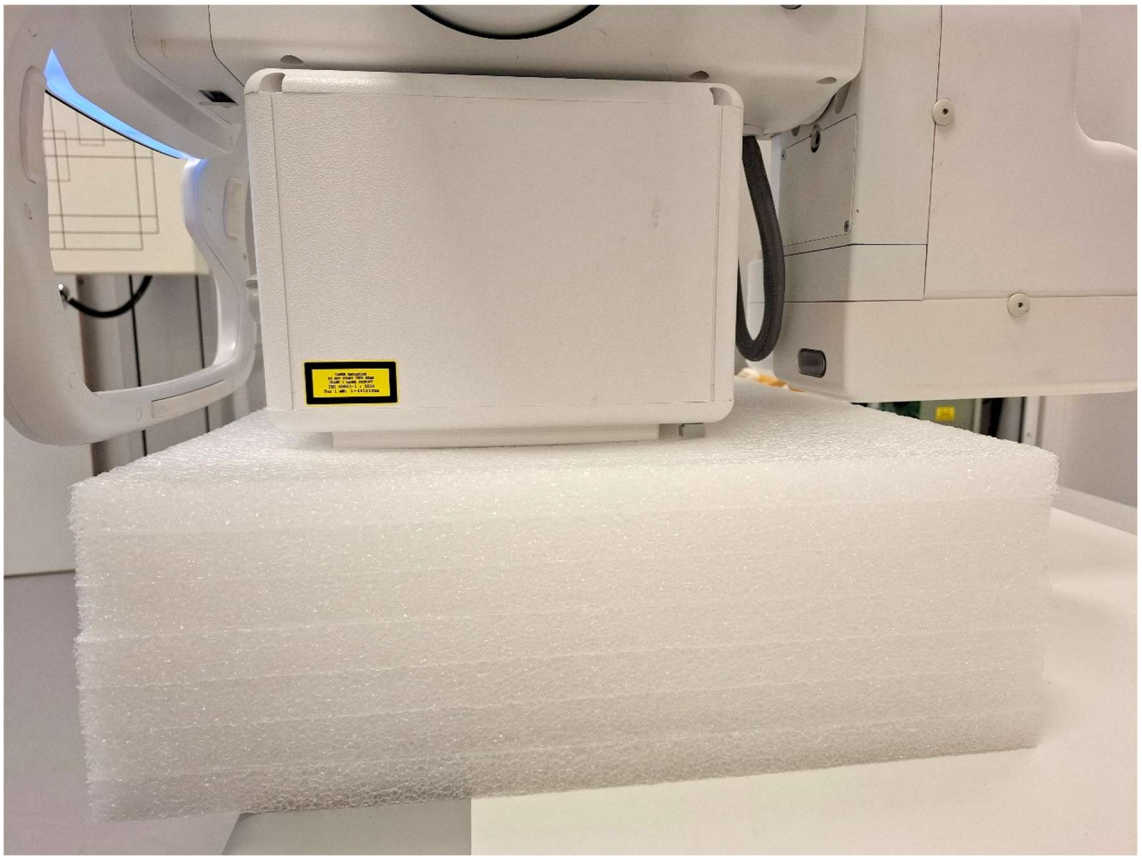


Rotating flange mounted

34. Reconnect the emergency stop.

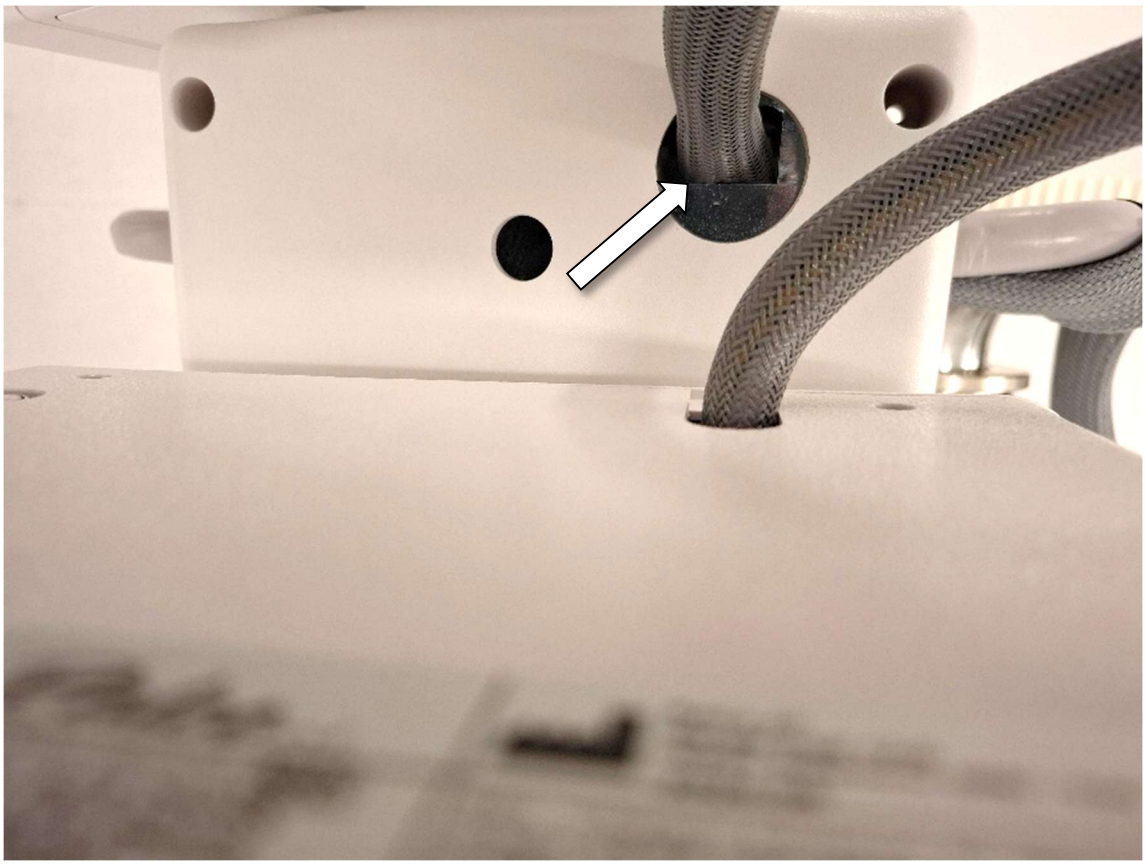
35. Position the collimator for the assembly to the tube head.

36. Carefully drive the table or OTC to match the collimator with the rotating flange.

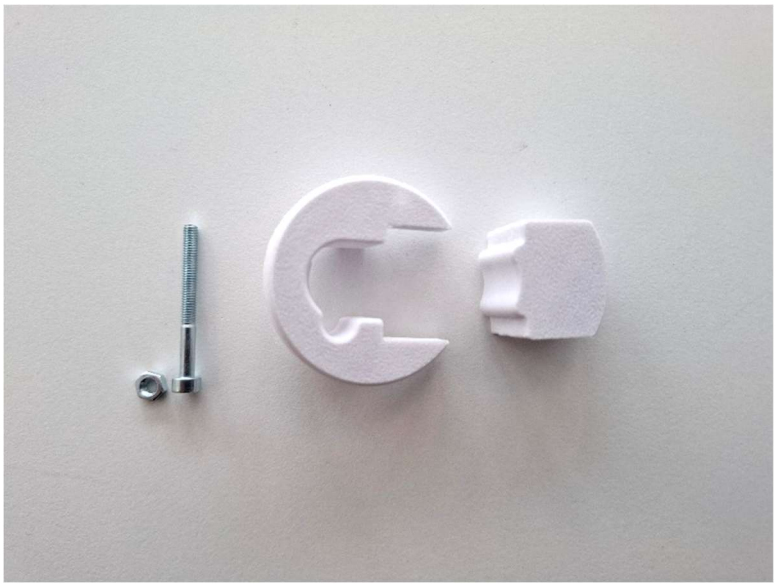


37. Use the stop screws to secure the collimator to the flange. There are four of them, located in each corner.

38. Thread the collimator wiring trough the lower cover.



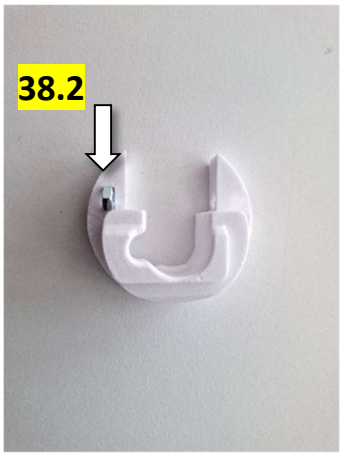
38.1 Assembly the cable gland.

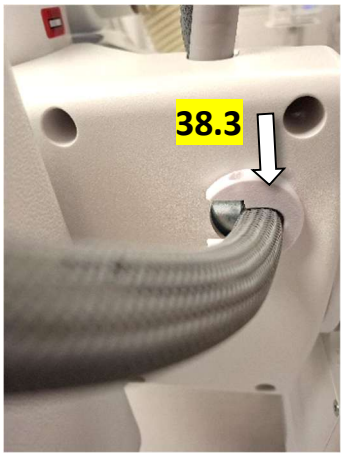


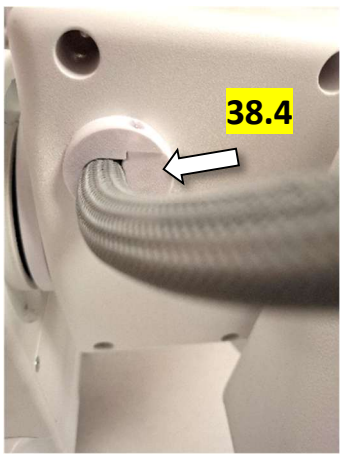
38.2 Insert the nut (M3) into the cable gland (part 1/2).

38.3 Assembly the part using in 38.2 into the cable entry.

38.4 Assembly part 2/2 of the cable gland into the cable entry.







38.5 Screw the cable gland together with a screw (M3x30).

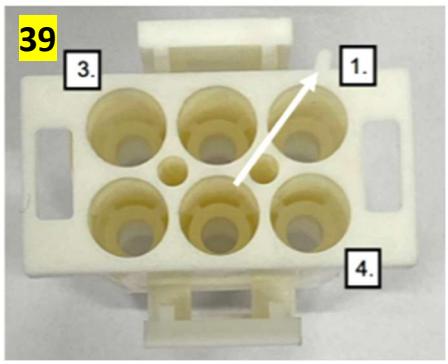
38.6 Press the small cover in place.

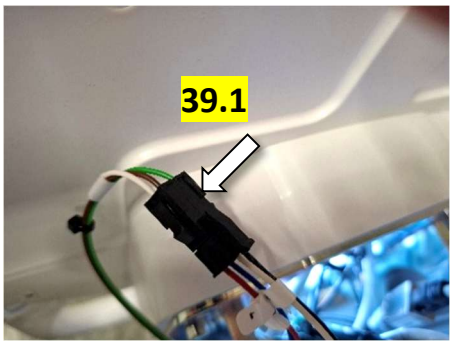
39. Connect white connector 1.6J02 (24V supply). Grey to PIN 3, black to PIN 4.

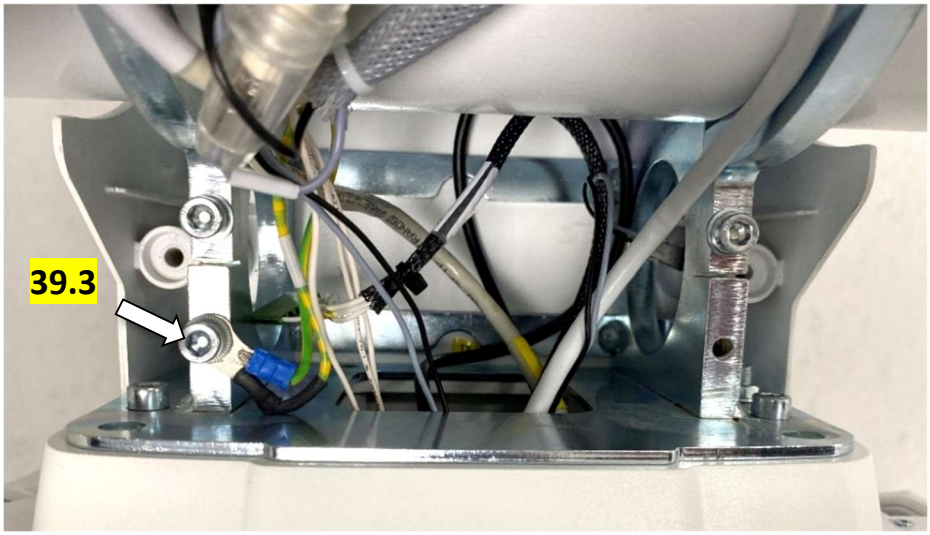
39.1 Connect black connector 1.3J07 (CAN).

39.2 Connect the Dap cable to the RJ45 connector.

39.3 Secure the ground wire (PE).

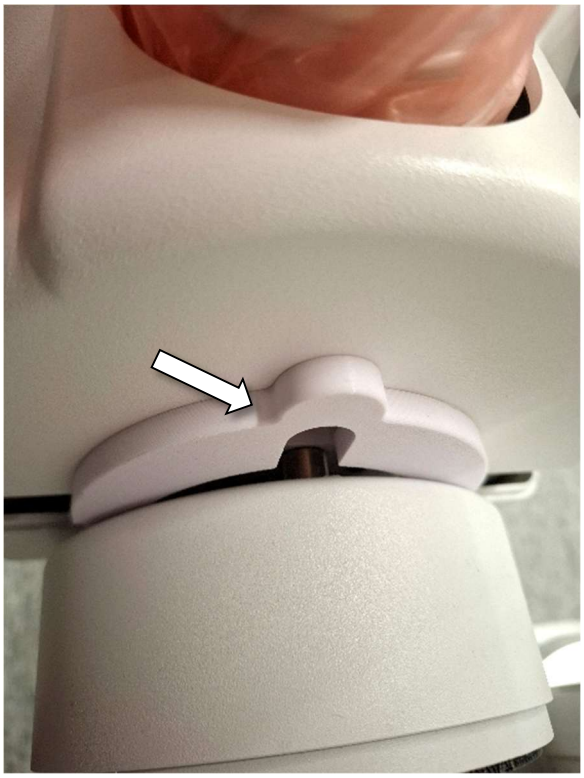






40. Re-mount the patient view camera (optional)

41. Glue the pinch guard on the upper tube cover.



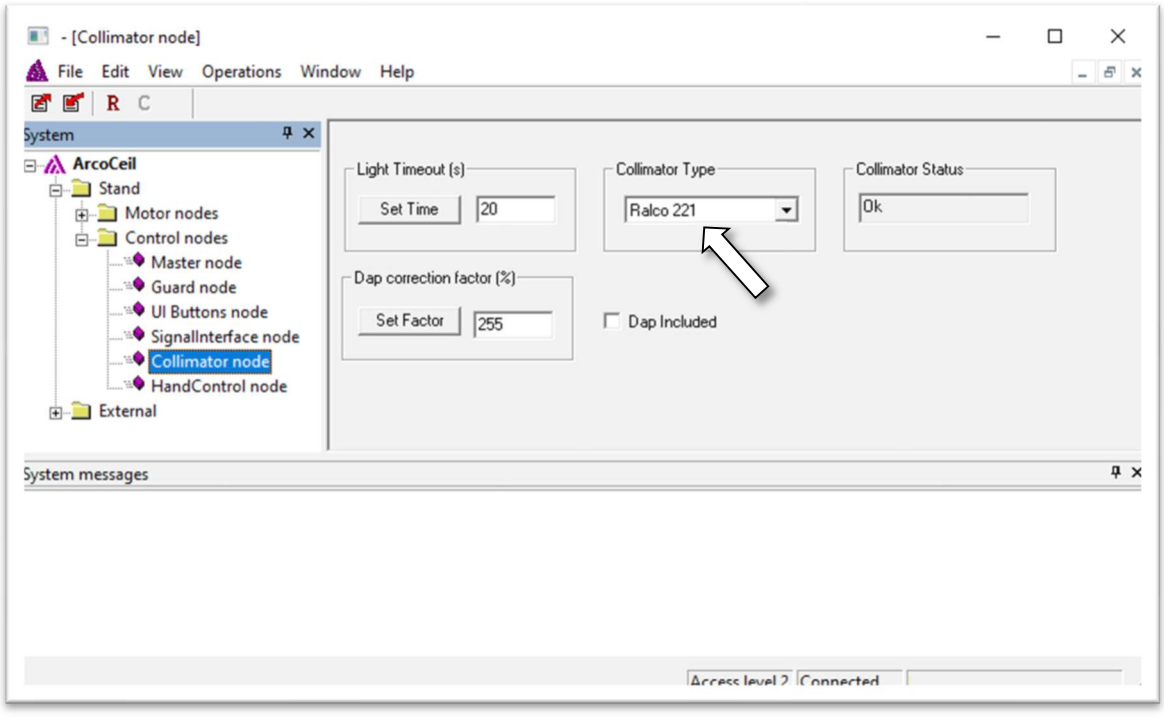
42. Reassemble the tube upper cover, according to step (6) but in reversed order.

43. Turn the system ON from the generator mini console.

44. Make sure the system boots up without any error messages.

45. The collimator must be installed perfectly straight. Control the collimator index position and perform adjustments if necessary.

46. Launch the service program ArcoCeil → Stand → Control Nodes → Collimator Node → select Collimator Type: Ralco 221.



47. Reboot the system to apply the changes.

48. Check all functions

49. Adjust x-ray/light if necessary. Instructions for adjusting the light field are referred to Ralco R221 instruction manual (chapter Calibration).

END OF DOCUMENT