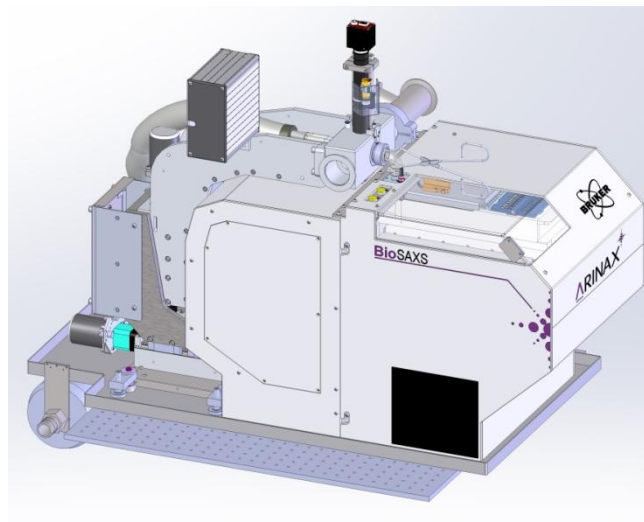




BioSAXS

INSTRUCTION NOTES MAINTENANCE MANUAL



Maintenance Manual

Release

| Release | Date | Name | Note |
|----------------|-------------|-------------|--|
| A0 | 04/05/2012 | ARINAX | Reviewed EMBL Document |
| A1 | 21/06/2012 | ARINAX | Detailed Mount-Unmount procedure |
| A2 | 12/02/2013 | ARINAX | Stop procedure modified |
| A3 | 19/03/2013 | JH | Add Valve-syringe cleaning, POD cleaning, Trouble shooting |
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Contents

| | |
|--|----|
| Maintenance Manual | 3 |
| 1 General information | 9 |
| 1.1 BioSAXS description | 9 |
| 1.1.1 SEU – Sample Exposure Unit | 10 |
| 1.1.2 SCU – Sample Changer Unit | 10 |
| 1.1.3 Fluidic rack | 10 |
| 1.1.4 Controller rack | 11 |
| 1.1.5 PC | 11 |
| 1.1.6 Pod | 11 |
| 1.2 Handling by qualified staff | 12 |
| 1.3 Safety | 12 |
| 2 BioSAXS commissioning | 14 |
| 2.1 BioSAXS installation | 14 |
| 2.1.1 Storage requirements | 14 |
| 2.1.2 Mount – Unmount | 14 |
| 2.1.3 Transport | 19 |
| 2.2 BioSAXS start up | 20 |
| 2.2.1 Electrical power supply | 20 |
| 2.2.2 Compressed air supply | 20 |
| 2.2.3 Cooling water supply | 20 |
| 2.2.4 Powering on the unit | 21 |
| 2.2.5 Pneumatic switches | 22 |
| 2.3 BioSAXS stop | 22 |
| 2.3.1 Electrical power off | 22 |
| 2.3.2 Pneumatics turn off | 22 |
| 2.3.3 Emergency stop | 23 |
| 3 BioSAXS maintenance | 24 |
| 3.1 Syringe valve cleaning | 24 |
| 3.2 Fluidic connector change | 26 |
| 3.3 Controller rack fuse | 27 |
| 3.4 HEPA filter change | 27 |
| 3.5 SEU vacuum seals change | 27 |
| 3.6 Visual control of the fluidic tubes and retention tank | 28 |

| | | |
|--------|--|----|
| 3.7 | Needle replacement | 30 |
| 3.8 | Pod manual cleaning | 30 |
| 3.9 | Sponge sensor change of the retention tank | 31 |
| 3.10 | Clean capillary | 32 |
| 3.10.1 | Automatic cleaning after each sample loading | 32 |
| 3.10.2 | Specific cleaning | 32 |
| 3.10.3 | Deep cleaning | 33 |
| 3.11 | Part list for maintenance actions | 33 |
| 4 | Well plate, PCR tubes references | 34 |
| 5 | Trouble shooting | 35 |

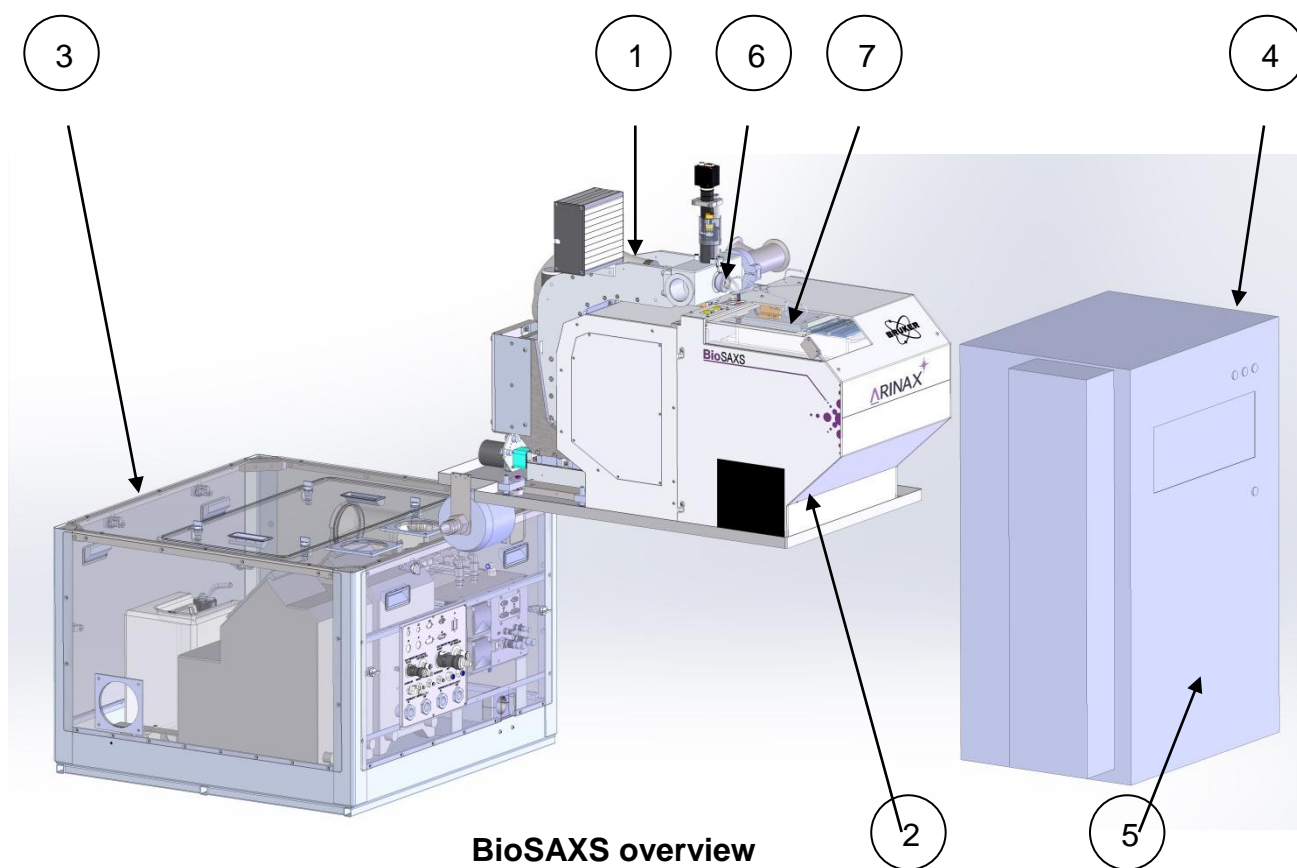
1 General information

1.1 BioSAXS description

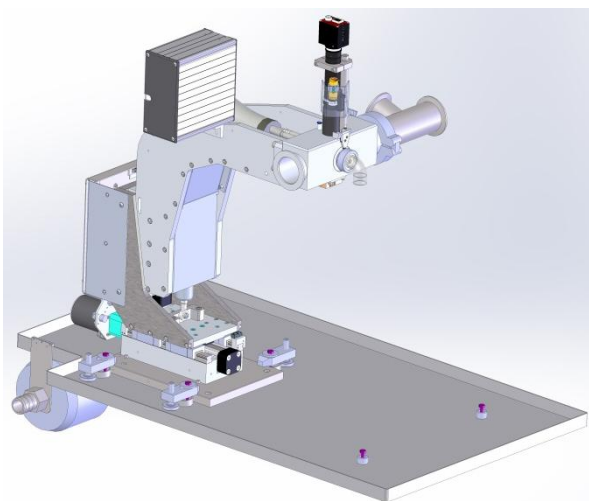
The BioSAXS is a scientific instrument which allows to expose a liquid solution into an X-ray beam in order to analyse it.

The robot has 6 parts:

- (1) The SEU (Sample Exposure Unit),
- (2) The SCU (Sample Changer Unit),
- (3) The Fluidic rack,
- (4) The Controller rack,
- (5) The PC
- (6) The Pod
- (7) The Sample well plate



1.1.1 SEU – Sample Exposure Unit

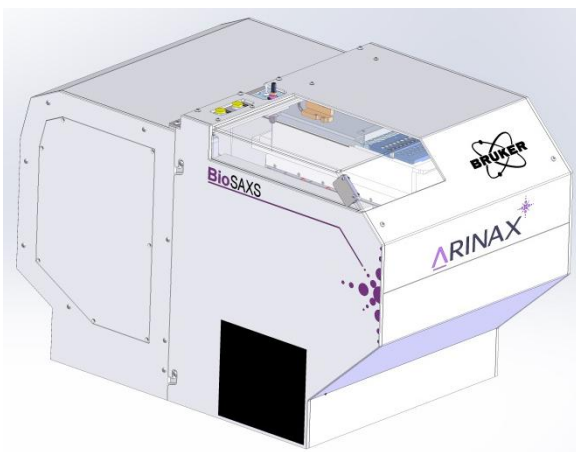


N°1 in the “BioSAXS overview” page 6.

The SEU holds the so-called Pod with the cylindrical glass capillary into which the liquid sample is transferred. The Pod is placed within the exposure cell which on its beam entry and exit is connected to the beam path vacuum. An integrated video microscope and a lighting system are used to visualize the glass capillary.

The exposure cell is thermally controlled and the temperature can be varied between 2°C and 60°C.

1.1.2 SCU – Sample Changer Unit



N°2 in the “BioSAXS overview” page 6.

The SCU is able to move well plates along three linear axes in the horizontal plane and in vertical direction. The well plate can be positioned so that the needle of the syringe pusher gets over and finally into a chosen sample well. Its cleaning system, which also can be placed under the needle, contains two wells: one with a cleaning detergent-water mixture and one for needle cleaning with dry air.

1.1.3 Fluidic rack



N° 3 in the “BioSAXS overview” page 6.

The Fluidic rack ensures the sample recuperation or disposal after its exposure to X-rays in the SEU, capillary cleaning and temperature regulation in the SCU and SEU using two independent liquid circuits.

1.1.4 Controller rack



N°4 in the “BioSAXS overview” page 6.

The controller rack provides the powering and compressed air supply for various BioSAXS modules (SEU, SCU and Fluidic rack). It contains also a programmable automate to operate different modules.

1.1.5 PC

N°5 in the “BioSAXS overview” page 6.

A standard Windows based PC is equipped with the BioSAXS control software “SC_BS”. The PC itself is located in the Controller rack. Screen, mouse and keyboard are in the control room.

1.1.6 Pod



N°6 in the “BioSAXS overview” page 6.

The Pod is made of a quartz capillary glued into a stainless steel support (Pod). The liquid to analyze is sucked by means of syringe from the sample well plate through the pod’s capillary, where the beam strikes it. Nut and seal at each end of the Pod ensure a leak-tight connection with the rest of the circuit.

The pod is a part that needs to be changed from time to time. This is due to the capillary’s degrading transparency after a certain amount of exposures.

1.2 Handling by qualified staff

The BioSAXS maintenance and handling has to be carried out by trained personnel. All interventions, like dismounting and repairing for example, have to be performed by trained and qualified beamline personnel.

1.3 Safety

In general, the user has to follow the on-site security rules for any performed operation. An example for such an operation is: the electric link of a given apparatus with a certified and protected socket, the handling of compressed air, etc.

Stickers are put on many elements of BioSAXS. It is important for your safety that you follow the labelled instructions since they warn you about possible hazards (electric, chemical, optic ...).



It is forbidden to dismount the fixed protection covers which protect BioSAXS devices.

The removable Plexiglas cover (n°7 in the “BioSAXS overview” page 6) is provided with a contact which, when opened, shuts down the motors powering, pumps and compressed air.

During a normal use, the BioSAXS can be powered ON and OFF as described in the §2 of this document. However, in case of emergency, there are two ways to stop it immediately:

- An emergency stop button with a 10 meters long cable can be placed everywhere around the machine. It shuts down the electric power supply as well as pneumatics.



BioSAXS emergency stop button

To restart the BioSAXS, see §2.3.3 page 17.

- The beamline emergency stop buttons, not to confuse with the BioSAXS emergency stop, are situated inside the experimental hutch.

WARNING: Pressing one of these buttons may power down the entire beamline.

Chemical and biological risks:

The DETERGENT tank contains a solution of alkaline concentrate HELLMANEX III (2%) which is a **corrosive chemical**.

The WASTE tank contains HELLMANEX III in solution (**corrosive**), and the sum of disposed samples (**hazardous**).

When manipulating these tanks, the use of gloves and safety glasses is mandatory. Please review the security sheets.

If handling error of the WASTE tank leads to a contamination you should vaporize KORSOLEX Endo-cleaner on an absorbing paper (spray and absorbing paper should be available in the experimental hutch) and clean-up the contaminated surfaces. The gloves and absorbing paper have to be disposed into any dedicated bin as defined by the beamline/synchrotron safety procedures.

Information and security sheets of the HELLMANEX III can be found on:

http://www.hellma-nalytics.com/downloads/290/en/dl_kat,23/hellmanex-iii.html

Information and security sheets of the KORSOLEX Endo-cleaner are on:

http://www.bode-chemie.com/products/instruments/korsolex_endo_cleaner.php

Note :

- ESRF safety standards had been followed on BioSAXS development. More information at <http://www.esrf.eu/Infrastructure/Safety>
- BioSAXS had been validated using HELLMANEX III and KORSOLEX. Guarantee does not apply for any damage that is caused by the use of other products.

2 BioSAXS commissioning

2.1 BioSAXS installation

2.1.1 Storage requirements

BioSAXS can be placed in any dry location in a synchrotron beamline experiment hutch. The hutch should be at room temperature: 20°C to 27°C. Never obstruct any Fluidic rack ventilation.

2.1.2 Mount – Unmount

The SCU, SEU, Fluidic rack and Controller rack are independent entities, mechanically speaking. Mounting the machine means connecting those entities between them, mechanically, electrically and in terms of fluids. Unmounting the machine means disconnecting those entities from each other, mechanically, electrically and in terms of fluids.

The SCU and SEU need to be put horizontally on a stable base, e.g. a “marble”.

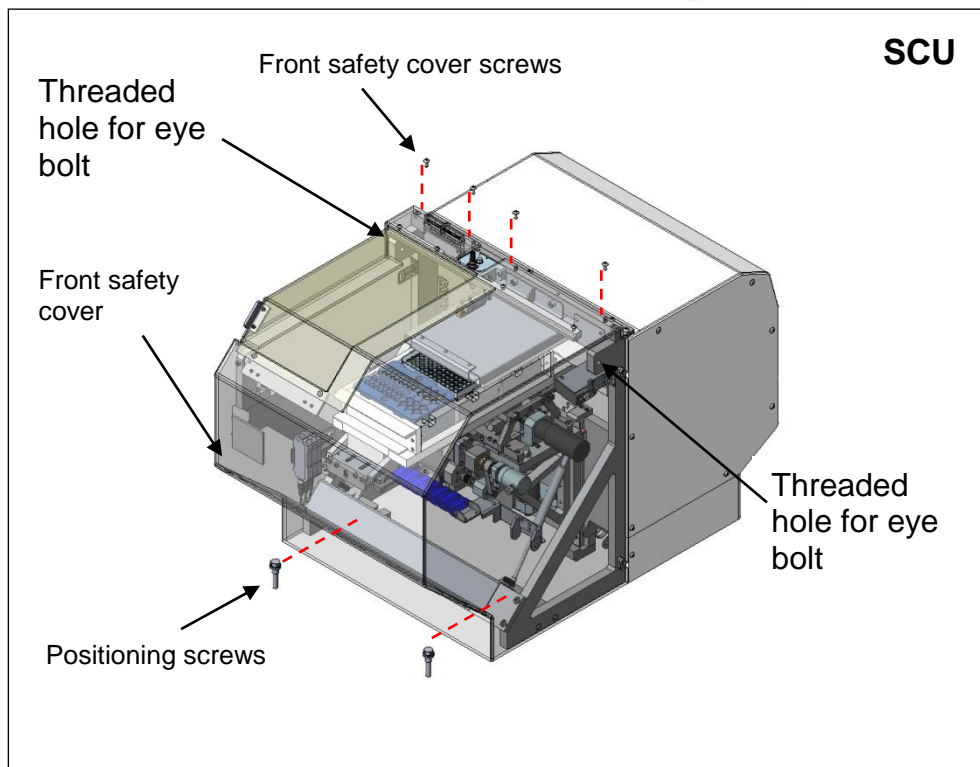
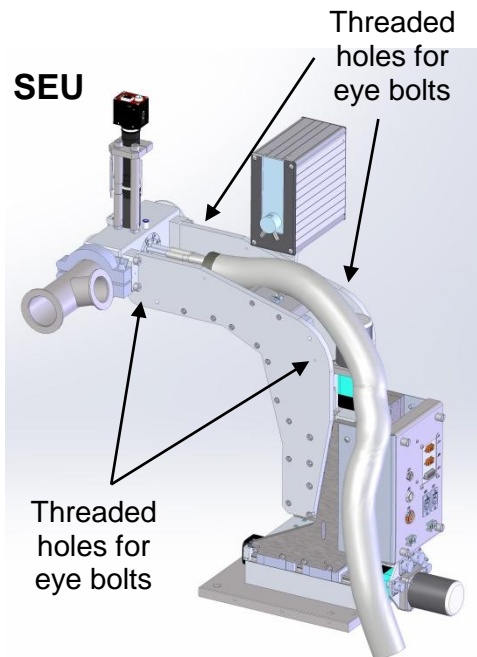
The SCU & SEU maximum weight is 40kg, respectively.

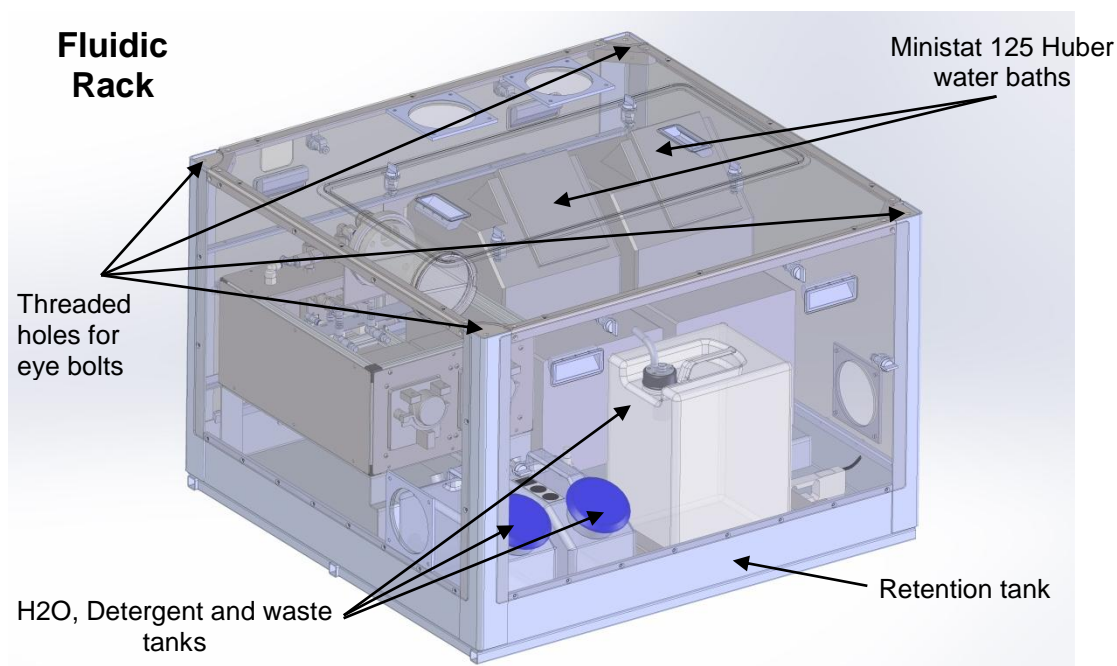
The SCU and SEU can be manually shifted without specific lifting tools. Still, two M8 threaded holes on the SCU, four M8 threaded holes on the SEU and four M10 threaded holes on the Fluidic rack are available to eye bolts (DIN 580).

The Fluidic and Controller racks can be placed on the ground beneath or aside the SCU/SEU.

The SEU and SCU modules can be removed easily and quickly for any end-user needs.

NOTE: During mounting and unmounting, vibrations are not a critical issue





SCU unmounting

- Push the **STOP** button on the Controller rack,
- Disconnect J7 and J8 connectors on the Controller rack to avoid any electrical short circuit,
- Disconnect electrical and fluidic connectors on SCU panel,
- Disconnect the tube between the Pod and the needle on the SCU top side,
- Unscrew the 3 fixation screws on the front safety cover and remove it,
- Unscrew the 2 positioning screws,
- Pull the SCU in negative Y direction and take it out carefully without touching the SEU (use eye bolts if necessary),
- Put back the front safety cover, screw it and close Plexiglas cover.

SCU mount

- Unscrew the front safety cover and remove the SCU front cover,
- Install the SCU carefully without touching SEU (use eye bolts if necessary),
- Tighten the 2 positioning screws,
- Put the front safety cover and screw the 4 fixation screws,
- Connect all electrical and fluidic connectors on the SCU panel,
- Connect J7 and J8 connectors on the Controller rack,
- Push the **START** button on the Controller rack.

SEU Unmount

- Push the **STOP** button on the Controller rack,
- Close all SEU vacuum valves and ventilate the SEU until ambient pressure is reached,

- Disconnect all electrical connectors on the SEU panel,
- Disconnect all fluidic connectors on the fluidic panel,
- If there is one, remove the Pod and store it (see “Replace pod” page 15),
- Disconnect the SEU from the beamline vacuum line,
- Unscrew the 4 SEU clamps,
- Remove the SEU and use a lift tool if necessary,

SEU Mount

- Move the SEU and use a lift tool if necessary,
- Tighten the 4 SEU clamps,
- Connect the SEU to the beamline vacuum line,
- Connect the tube between the Pod and the syringe pump,
- Connect all fluidic connectors on the fluidic panel,
- Connect all electrical connectors on the SEU panel,
- Push the **START** button on the Controller rack.

Unmount the entire system (SCU + SEU+ Controller rack + Fluidic rack)

- Switch off the electric power and the pneumatic system (see §2.3 page 19),
- Shut down the BioSAXS PC,
- Disconnect all electrical connectors on the Controller rack, the SEU, the SCU and the Fluidic rack panel,
- Disconnect all pneumatic and fluidic connectors on the Fluidic rack panel, the SCU and the Controller rack. Be careful of remaining fluids in the pipes,
- Take off the Fluidic rack Plexiglas panel on the connectors side,
- Unscrew the reinforced pipe holding clamp of the Fluidic Rack and remove the reinforced pipe end from the Fluidic rack,
- Loosen the filter support from the SEU-SCU retention tray and place it inside the Fluidic rack,
- Unscrew the touch screen support and remove it,
- Unmount the SEU,
- Unmount the SCU,
- Empty the two thermal baths, empty the H₂O and detergent tanks, and remove the waste tank,
- Remove the SEU-SCU retention tray.

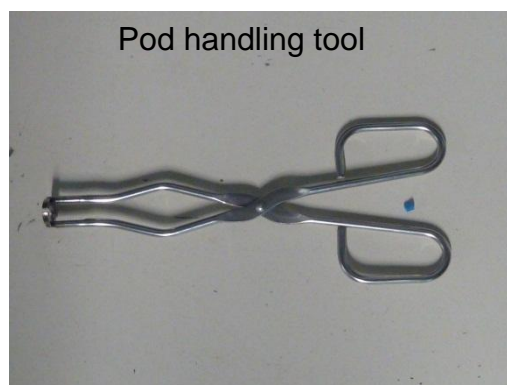
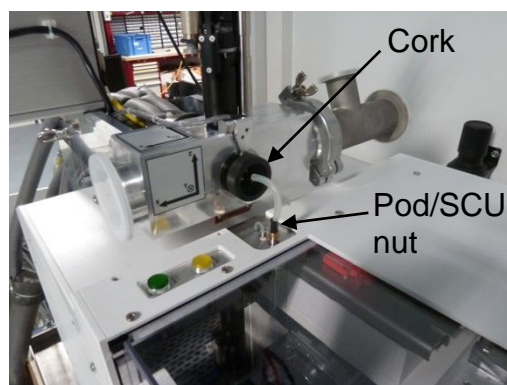
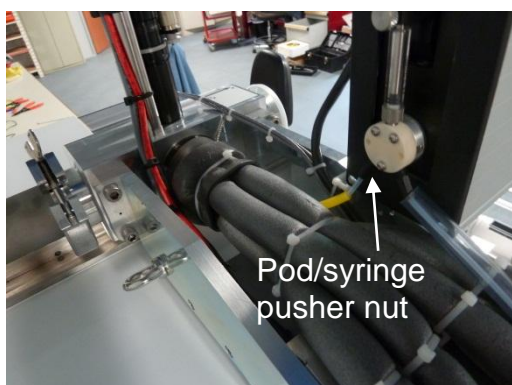
Mount all the system (SCU + SEU+ electronic rack + Fluidic rack)

- Put in place the SEU_SCU retention tank,
- Refill the two thermal baths, the H₂O and detergent tanks, and put in place the waste tank,
- Mount the SCU,
- Mount the SEU,
- Put back in place the touch screen and fix the screen support,
- Place the filter support on the SEU-SCU retention tray and tighten it,

- Insert the reinforced pipe end in the Fluidic rack clamp and tighten the clamp screws,
- Put back the Fluidic rack Plexiglas panel on the connectors side,
- Connect all pneumatic and fluidic connectors on the Fluidic rack panel, the SCU and the Controller rack,
- Connect all electrical connectors on the Controller rack, the SEU, the SCU and the Fluidic rack panel,
- Switch on the BioSAXS PC,
- Switch on the electric power and the pneumatic system (see §2.2 page 17).

Replace Pod

- Unscrew the nut that link the Pod on one side to the syringe pusher,
- Unscrew the nut that link the Pod on the other side to the SCU,
- Unscrew and remove the cork,
- Remove the Pod using the Pod handling tool. Avoid shocks at any time,
- Store the pod in a shock proof area,
- Place a new pod using the pod handling tool. Be careful of the orientation of the pod: the groove must be upward. Avoid shocks,
- Screw back the cork,
- Screw by hand the nut that link the Pod to the SCU, never use tools to screw the nut,
- Screw by hand the nut that link the Pod to the syringe pusher, never use tools to screw the nut.



2.1.3 Transport

This machine is fragile scientific equipment and must be handled carefully.

All element must be separated, packed, and protected (against shock and humidity!) and mustn't be turned and stacked.

Main parts weights are:

- SEU: 40kg
- SCU: 40kg
- Touch screen (its support is not part of the delivery): 5kg
- Controller rack: 80kg
- Fluidic rack : 130kg (tank and water bath empty)
- Water bath Ministat 125 from Huber (empty): 2 x 25kg
- Tubes and cables: 10kg

2.2 BioSAXS start up

2.2.1 Electrical power supply

BioSAXS shall be connected permanently to the beamline's three-phase power line (400 V).

2.2.2 Compressed air supply

BioSAXS shall be connected to the beamline's dry and oil free compressed air network. The pressure must be 5.5bars (+/-0.2) . The connector type is: *quick ext. diam. 8 mm* from Festo.

2.2.3 Cooling water supply

BioSAXS contains three water cooled devices: two Huber stations and the Controller Rack cooler.

The Huber stations: cooling water properties

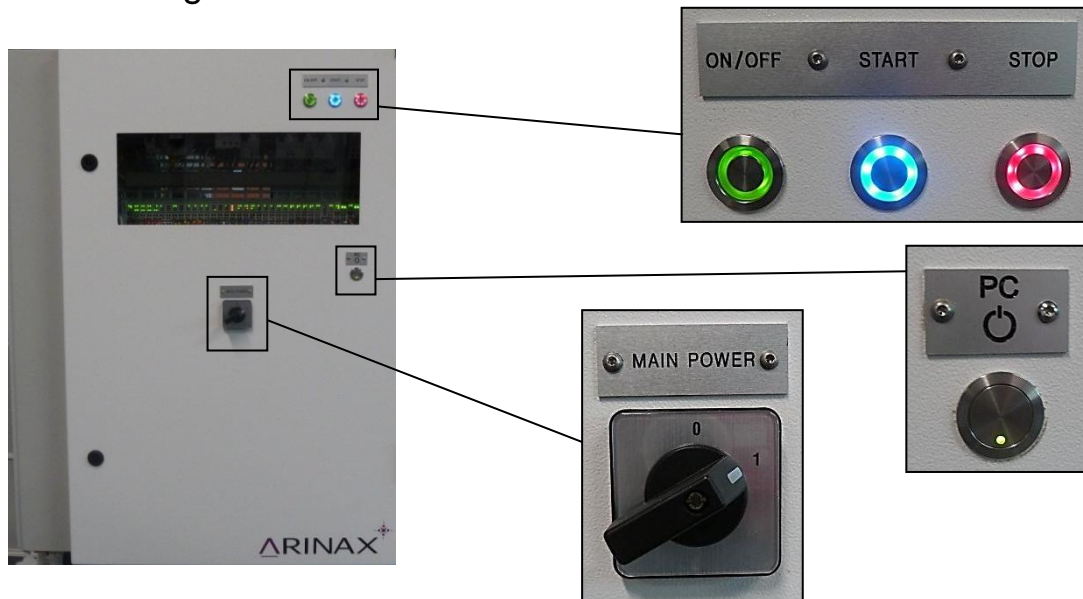
- Cooling water connection G1/2 female.
- Consumption at water 15°C, flow 0°C 11 l/h
- Min. cooling water differential pressure 2 bars
- Max. cooling water pressure 6 bars

The Controller Rack cooler: cooling water properties

- Cooling water connection for pipe internal diameter 10mm
- Max. flow rate 500l/h
- Pressure Drop at flow rate 500l/h ,1 bar
- Max. cooling water pressure 10 bar

Datasheets of those three devices are provided on the BioSAXS DVD.

2.2.4 Powering on the unit

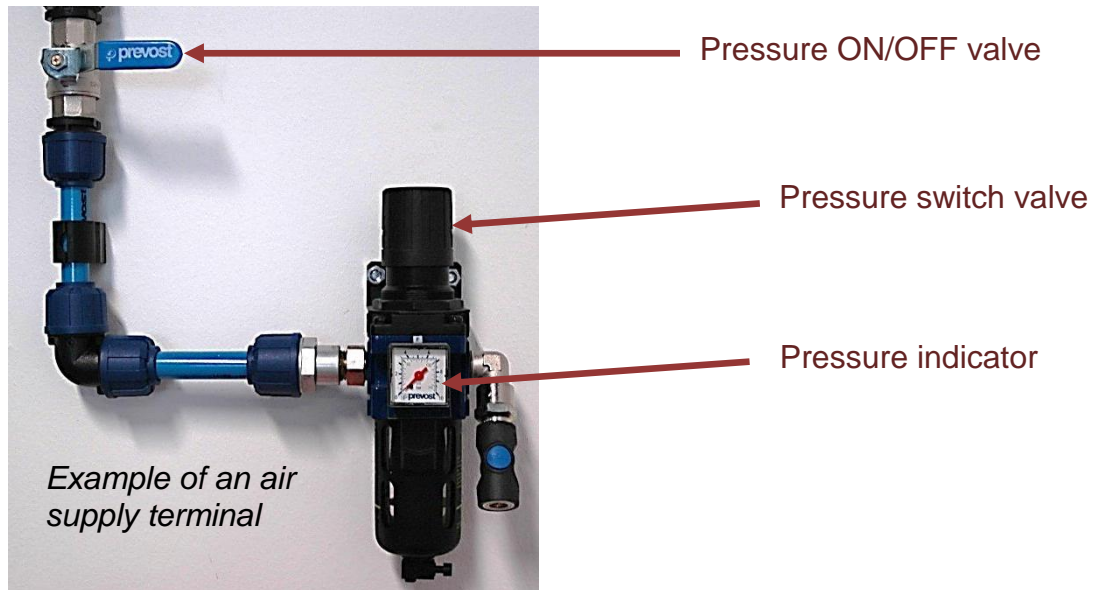


- Connect the 3-phases cable to the beamline's power network.
- Turn on the MAIN POWER switch.
- Push the **ON/OFF** switch: the green light is on. The Beckhoff PLC/I-Os controller is turned on. START and STOP light switches are on (blue and red),
- Push the **START** switch: motors and pneumatic are turned on (if cover is closed).

NOTE:

- The power supply of the PC and cooler within the Controller rack does not depend on the MAIN POWER and ON/OFF switches. They are supplied by the 3-phases cable of the controller rack.
- The PC can be switched off/on by pressing the PC button on the Controller rack.

2.2.5 Pneumatic switches



Turn the pressure ON/OFF valve.
Pressure indicator must display 5.5 bars (± 0.2 bars), if necessary adjust the pressure with the pressure switch valve.

2.3 BioSAXS stop



Before a long shut down of the machine (more than 2 days) the tubes, syringe and valve must be cleaned (see 3.1).

2.3.1 Electrical power off

To stop the BioSAXS, use the Controller rack switches or the main beamline switch(es) if any.

- Press the **STOP** switch: motors and pneumatic are turned off.
- Switch off the **ON/OFF** switch: switch lights are off, the Beckhoff PLC is turned off, and just the two thermal baths are supplied.
- Turn off the MAIN POWER switch.
- Press the PC button to turn it off if needed.
- Disconnect the 3-phases cable from the beamline's power network if needed.

2.3.2 Pneumatics turn off

Activate the Pressure ON/OFF valve to turn off the pneumatics.

2.3.3 Emergency stop

BioSAXS is equipped with a freely cabled (10 m length) emergency stop switch, which can be placed anywhere around the machine.

To turn off the power supply for electrics and pneumatics, push the emergency stop switch.

To restart the BioSAXS, unlock the emergency stop switch (turn the button), and push **START** on the Controller rack.

3 BioSAXS maintenance

3.1 Syringe valve cleaning



Syringe valve cleaning: **USE GLOVES, and PROTECT GLASSES** available in the hutch.



Syringe valve cleaning: every week



Procedure for cleaning the syringe valve pump :

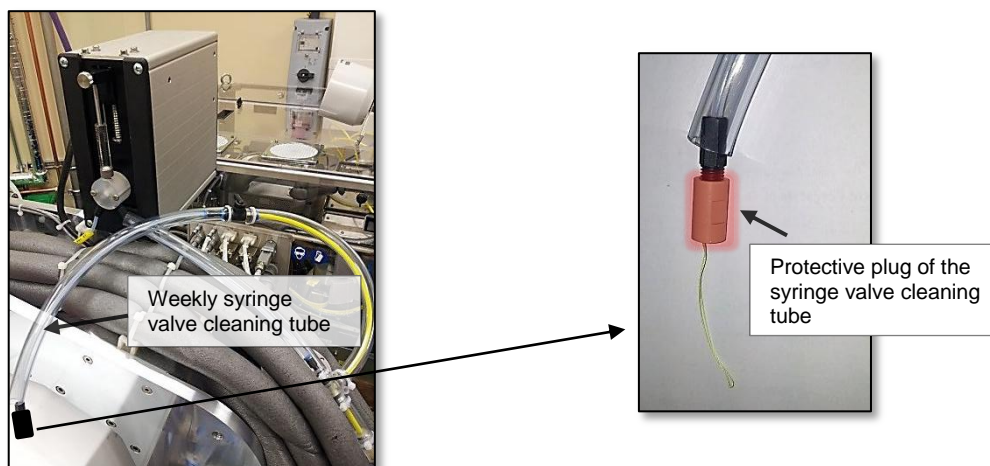
On SC application run Syringe Valve clean script and follow instructions. (Click on OK for the first pop up without parameters)

The following pictures explains different steps to realize during the script.

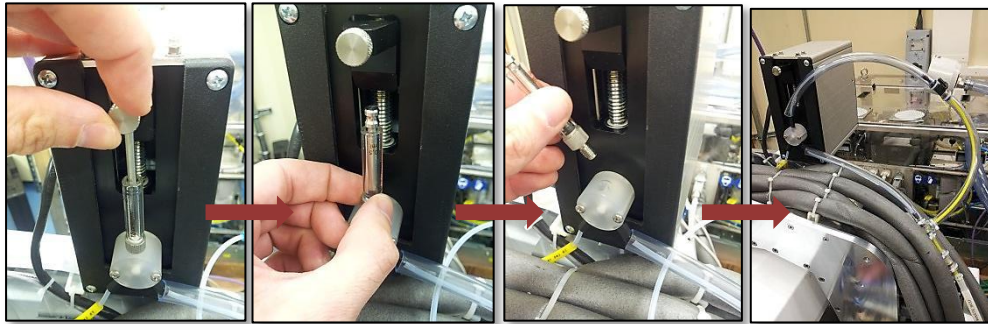
During the process, when syringe is taking off, clean the syringe (plunger seal + syringe barrel) with detergent solution (2% Hellmanex III, 10% Ethanol, 88% distilled water) and rise it with distilled water.

Mount syringe-valve cleaning tube :

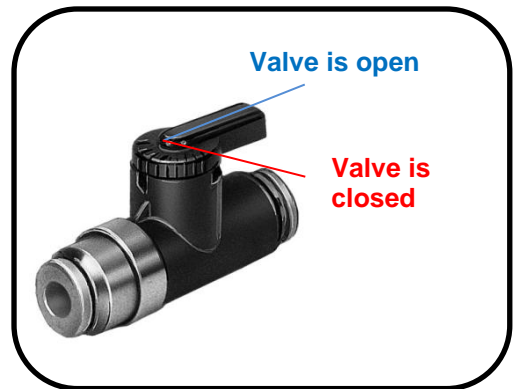
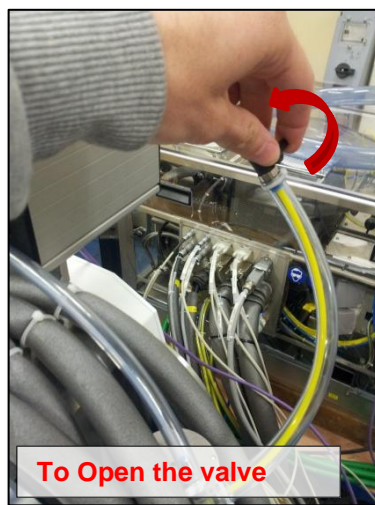
1) removing of the protective plug at the extremity of the weekly syringe-valve cleaning tube :



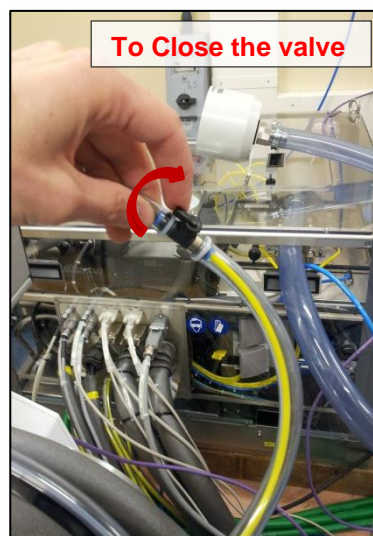
2) Unmount the syringe from the Syringe-valve pump and connect the weekly syringe-valve cleaning tube :



Open weekly syringe-valve cleaning tube



Close weekly syringe-valve cleaning tube

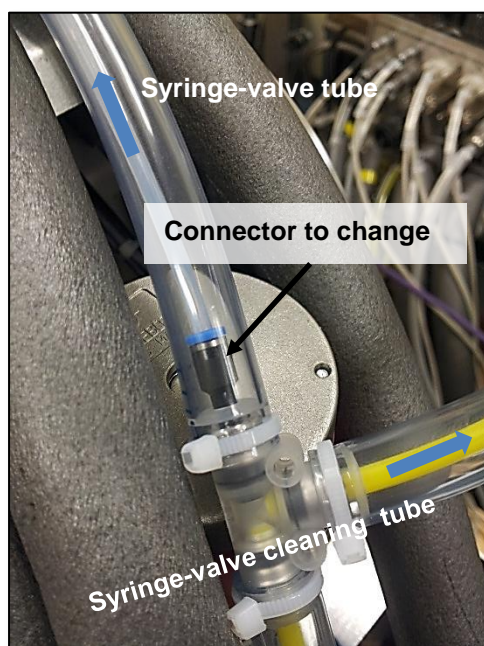


3.2 Fluidic connector change



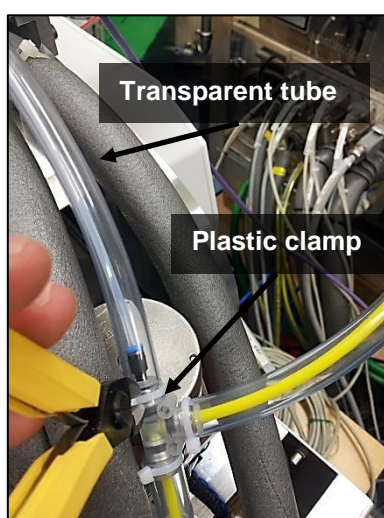
Syringe valve cleaning: **USE GLOVES, and PROTECT GLASSES** available in the hutch.

Fluidic connector must be changed every year



To change the fluidic connector :

1) cut and remove the plastic clamp :



- 2) Take off the transparent tube
- 3) Remove the connector and change it
- 4) Remount the transparent tube on connector

5) Put a new plastic clamp

Fluidic connector reference : Festo - QSM-4H-3 : 153 328

3.3 Controller rack fuse

Two fuses protect the Controller rack. (ref : 5x20 T3.15A 240VAC) .

3.4 HEPA filter change

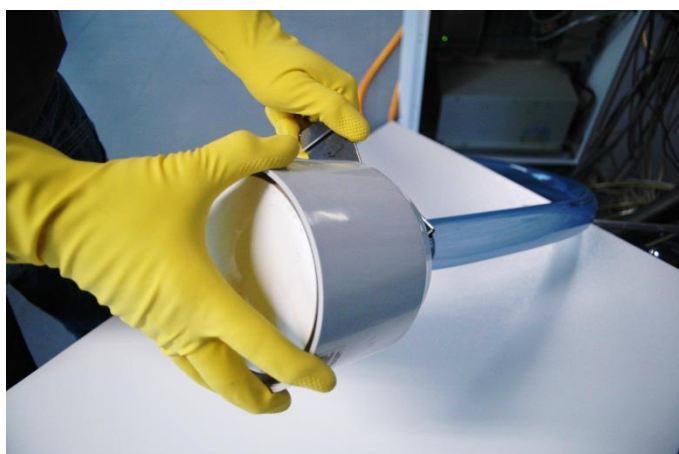


Each filter manipulation: **USE GLOVES, and PROTECT GLASSES** available in the hutch.



HEPA filter change: every 6 months (shutdown schedule)

- Unscrew filter:

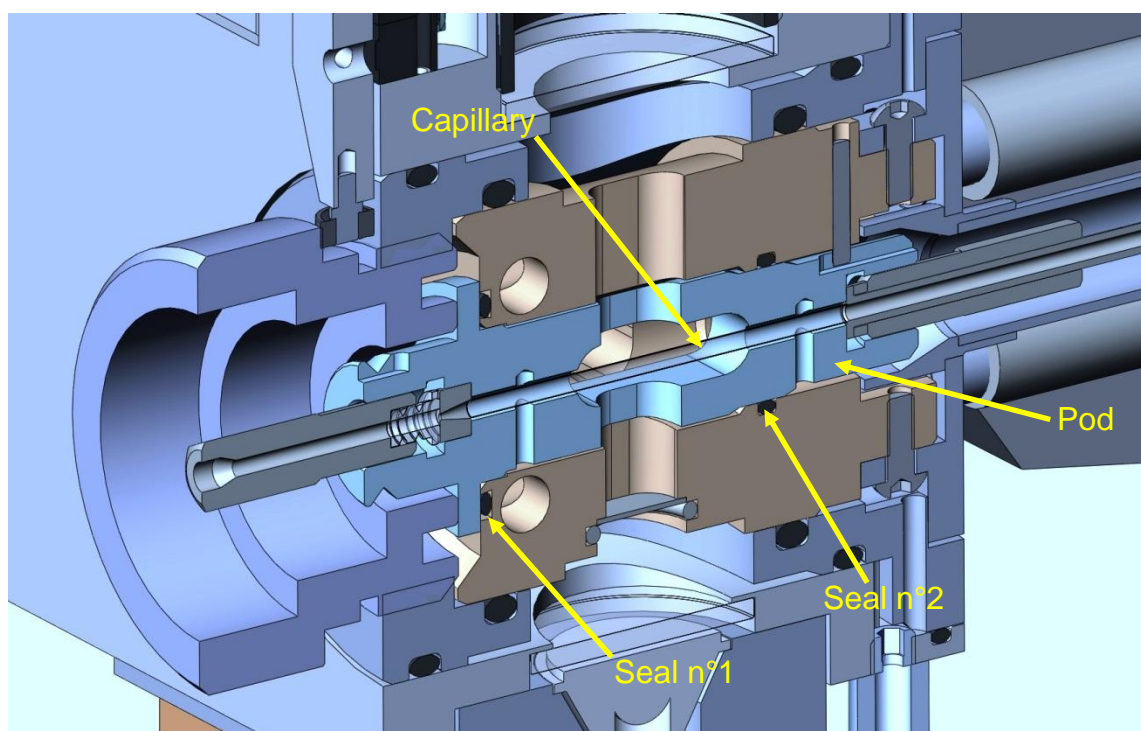


- Throw in the dedicated experiment hutch garbage collector (Infectious Hazard).

- Screw in a new filter in (Reference: Camfil-Farr :32110100)

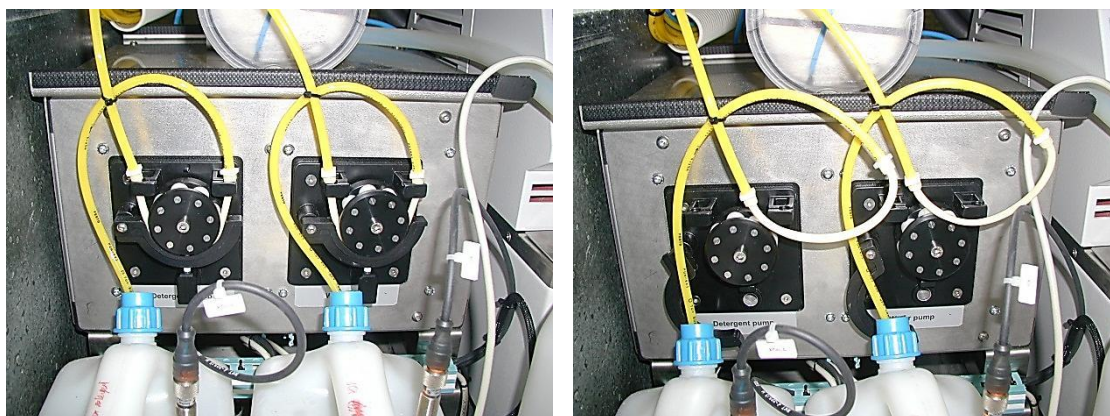
3.5 SEU vacuum seals change

- Change 2 vacuum seal every 12 months or if required. See the following drawing.
- Remove the pod (See “Replace pod” in §2.1.2 page 15),
- Remove the 2 seals by mean of a small crimp or a needle
- Clean seal prints with ethanol,
- Put vacuum grease on the seals
- Put the 2 new seals – References are :
 - Seal n°1: material EP851 – Dimension: 17.17 x 1.78 mm
 - Seal n°2: material EP851 – Dimension: 13.10 x 1.6 mm.



3.6 Visual control of the fluidic tubes and retention tank

Fluidic tubes control period: at least once per year



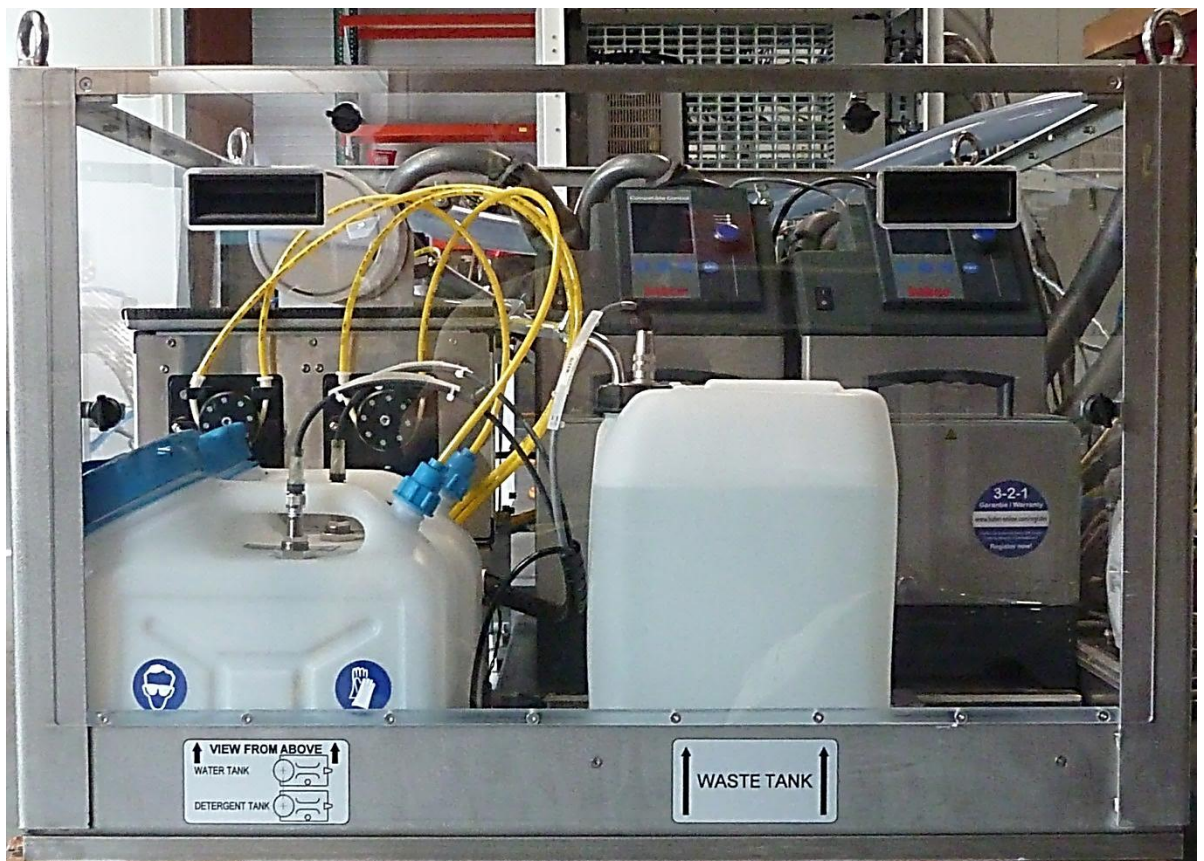
- Remove the 2 peristaltic pump tubes (picture above)
- Visually check that the 2 peristaltic pump tubes are not cracked or damaged, and that there is no leak close to the connectors. Change them if necessary (Tube 3mm TECAN Ref : 20725372),



-Visually, check the tube on the waste container is placed correctly (it should made a smooth slope from the decantation cylinder downwards the waste tank) and not damaged, change it if necessary. Ref: PVC tube Tricoflex – 096201.



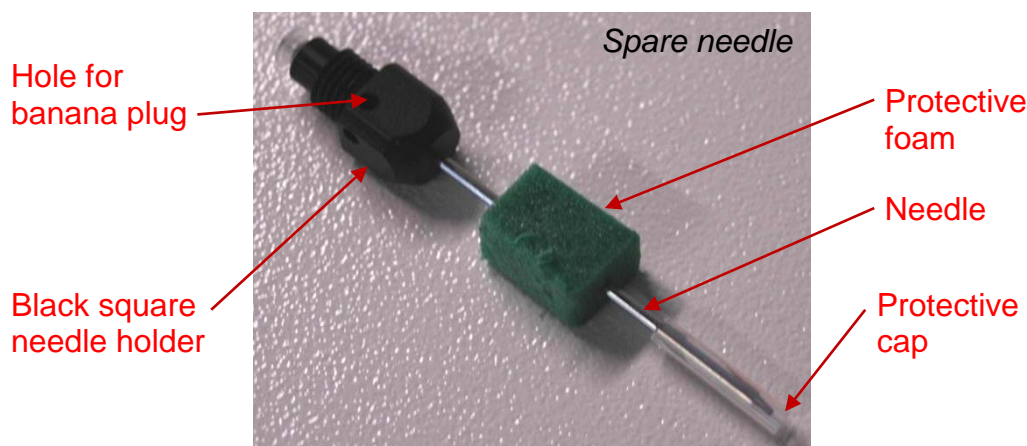
When refilling the H₂O-detergent or removing the waste container first check that there is not liquid in the retention tank.



3.7 Needle replacement

If the needle is bent, the robot won't find its reference. Needle will have to be replaced (a spare one is in the BioSAXS Toolbox).

- Remove banana plug from the black square needle holder,
- Unscrew the black square needle holder with the bent needle,
- Remove protective cap and foam from the spare needle,
- Screw by hand the spare needle with its black square needle holder until contact, (never use tools to screw the needle)
- Put back the banana plug in the black square needle holder.
- Initiate a "needle position" (click button) and then launch a "calibrate" procedure (click button). You find these buttons in the BioSAXS Graphical User Interface.



NOTE:

Spare needle can be bought from MAATEL (reference ME-BSAX-126 10 00).

3.8 Pod manual cleaning



After many use of a pod, automatic cleaning is not efficient enough. A manual cleaning with a more concentrated solution is needed.



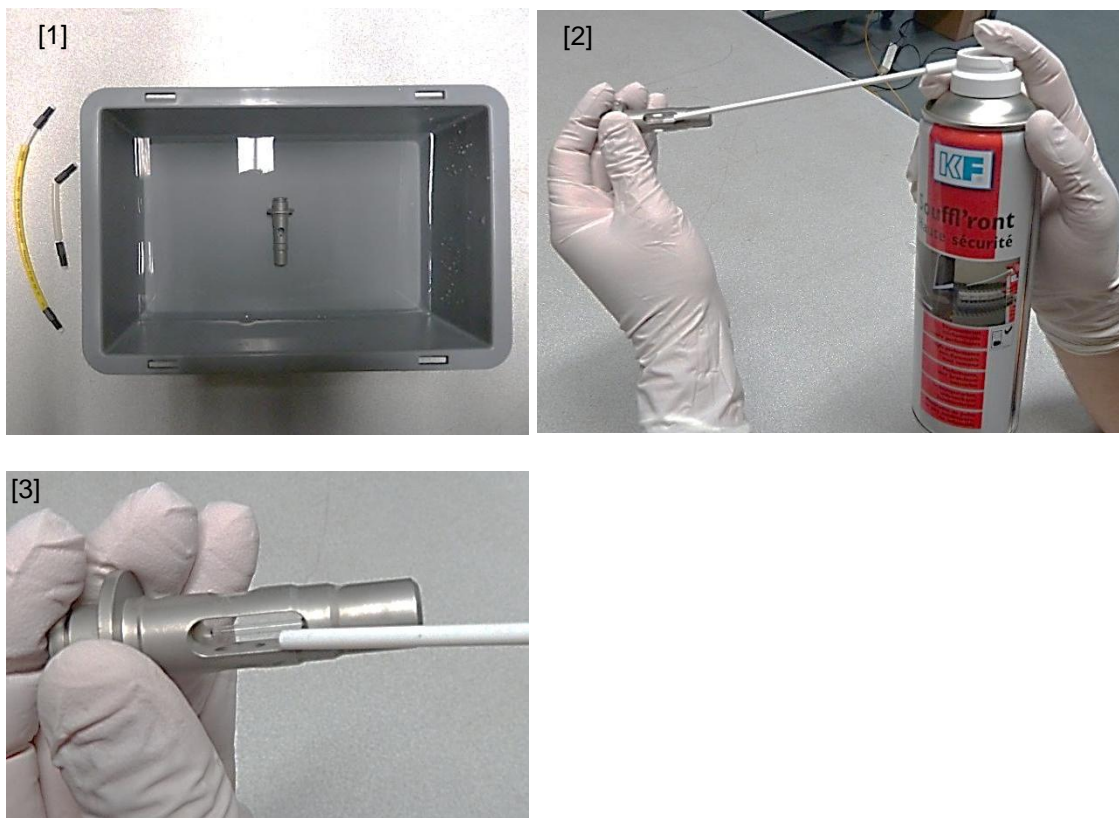
- Unscrew and remove both tubes from the metallic part of the pod [1],
- Place the metallic part with the capillary in a solution 10% vol. Hellmanex III + 90% vol. demineralized water for 10 minutes [1],



- Rinse the metallic part with the capillary in demineralized water,
- Dry the whole by blowing dry air outside and inside [2]. Be careful of the blowing angle when approaching the capillary: **DO NOT BLOW STRAIGHT AT THE CAPILLARY** [3],
- Screw back the tubes.

NOTE:

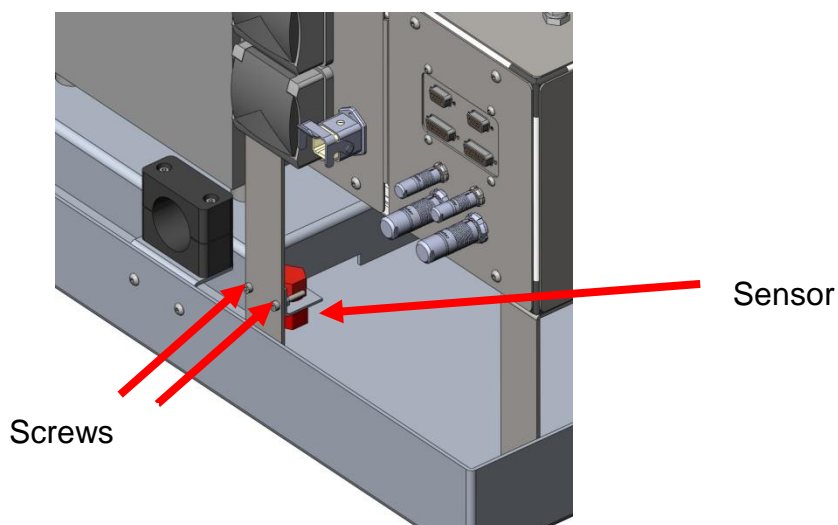
- DO NOT BLOW STRAIGHT AT THE CAPILLARY. It may break it.
- NO MORE THAN 10 MINUTES IN THE CONCENTRATE SOLUTION. The glue begin to be attacked



3.9 Sponge sensor change of the retention tank



Sponge change : Every year
Attention : SC not available during few hours after this intervention.



- Unscrew the 2 sensor support screws
- Unscrew the screw nut with the sponge of the sensor
- Change sponge by a new dry one

- Screw the bottom part of the sensor
- Mount the sensor support : sponge must be in contact with the retention tank and the distance between the screw nut and retention tank must be few millimeters.
- Start SC
- Open application and check that there is not Flooding error
- Put water on sponge and check that Flooding error appear
- Wait that the sponge will become dry (few hours), check that the error disappear.

3.10 Clean capillary

3.10.1 Automatic cleaning after each sample loading

After each sample loading a cleaning of the tubes and capillary is done.

Default parameters entered in application:

Wash time : 3s (Detergent : Hellmanex, ethanol, demineralised water)

Rinse : 3s (demineralised water)

Dry : 15s (dry air)

3.10.2 Specific cleaning



USE GLOVES AND SAFETY GLASSES both can be found in the hutch.



After one hundred sample loading and exposure some aggregates appear inside the capillary.

A specific cleaning must be done:



Please follow these steps:

a) Load 80 µl of a solution constituted of (70% demineralised water and 30% of Hellmanex) inside the capillary, on BSSC application click on the “fixed position <|> ” button.

b) Set SEU temperature to 50°C and wait until it stabilises.

c) Keep the solution in the capillary during 10min at 50°C

d) Click on Cleaning button on BSSC application

e) Reload 80µl of the same solution at the same temperature (50°C).

f) Click on Flow button on the application with the following parameter: 400s

g) Click on Cleaning button on the application to finish the specific cleaning

Note: the cleaning solution must be stored at -20°C.

3.10.3 Deep cleaning

USE GLOVES AND SAFETY GLASSES both can be found in the hutch.



When Specific cleaning doesn't work (external wall of capillary are dirty, or too much of aggregates) it becomes necessary to do a deep cleaning capillary's internal and external wall.



Please follow these steps:

- a) Remove the capillary
- b) Prepare 400ml of a solution constituted of 90% of demineralised water, and 10% of Hellmanex in a tank.
- c) keep the capillary in the solution during 0.5-1 hour (don't exceed 1 hour)
- d) Rinse the capillary, several times, with demineralised water and Ethanol
- e) Put the capillary in the SEU and check if it was cleaned properly (no remaining dirty traces).



Note: it is better to change or clean the tubes between SCU and SEU and between SEU and Syringe pump after each deep cleaning

3.11 Part list for maintenance actions

| Part | Refence | Brand | Quantity |
|---|-----------------------------------|-------------|----------|
| Fluidic connector (chapter : 3.2) | QSM-4H-3 : 153 328 | Festo | 1 |
| Fuse 5x20 3.15A T (chapter : 3.3) | 34.3122 | Schurter | 2 |
| HEPA filter (chapter : 3.4) | 3211-01-00 | Camfil-Farr | 1 |
| Toric seal (chapter : 3.5) | EP851 Dim : 17.17 x 1.78 mm | | 1 |
| Toric seal (chapter : 3.5) | EP851 Dim : 13.10 x 1.6 mm | | 1 |
| Peristaltic pump tube (chapter : 3.6) | 20725372 | TECAN | 2 |
| PVC tube (chapter : 3.6) | 096201 | Tricoflex | 1m |
| Waste container (chapter : 3.6) | X1.9 approved tank – 10 Litres | | 1 |
| Detergent Hellmanex III (chapter : 3.6) | Hellmanex III | Hellma | 1l |
| Needle assembly (chapter : 3.7) | ME-BSAX-126 10 00 | Maatel | 1 |

4 Well plate, PCR tubes references

Use **only** the following 96 well plates and PCR tubes with the BioSAXS SC.




To seal the PCR tube use **only** following adhesive tape (validated with SC).

| Part | Refence | Manufacturer | Note |
|-----------------------------|-------------|------------------|-----------------|
| 96 well SBS plate | 651 201 | Greiner | |
| 96 deep well plate | AB-0932 | ABgene | |
| PCR strip tube | 673201 | Greiner | Use without cap |
| 1.5ml buffer tube | 0030120.086 | Eppendorf | Cut tube cap |
| Adhesive tape for PCR tubes | HR4-506 | Hampton research | |

5 Trouble shooting

| Trouble | Explanation | Action |
|---|---|--|
| Collision detection | Needle was pushed | <ul style="list-style-type: none"> -Open the transparent cover. -Check if any part can push the needle (Plate or tube placed incorrectly ...), remove or replace them correctly. If the collision is caused by the cleaning station, try to screw the needle until it does not touch this unit. If necessary close the cover and click on Move Table Down button on BSSC application. - Close the transparent cover. - Click on RESTART button on BSSC application + select: init hardware. <p>In other cases, please call maintenance staff.</p> |
| No overflow aspiration | Overflow sensor didn't detect vacuum (this sensor ensure absence of water/detergent overflow during cleaning procedure) | <ul style="list-style-type: none"> -Check if the cover is well closed. If needed, open and close it again. -Check the air supply pressure on the pressure indicator: it must be at 5.5 bars (+/-0.2bars). -Check on fluidic panel (back of the machine) if the RED tube (OverFlow) is connected correctly. - Click on RESTART button on SC application+ select: init hardware. <p>If air supply and connector are OK and error is always present, please call maintenance staff.</p> |
| Initialization error : Video not working | Application can't communicate with camera | <ul style="list-style-type: none"> - Check if the camera (SEU) green light is on and yellow light is blinking or fixed. - Check if the camera Ethernet and power supply cables are connected correctly. - If an external video server is used, please verify that it works correctly. -Close BSSC application. -Restart PC. -Restart BSSC application. <p>If the problem is always present even after a restart, please call maintenance staff.</p> |
| Initialization error: Serial port com not available | Application can't communicate with Tecan devices, exposure and storage temperature controllers, Bar code reader | <ul style="list-style-type: none"> - Close application. - Switch off and on the electronic rack (Green button). - Push on the blue button on electronic rack. - Restart BSSC application. <p>If the problem is always present even after a restart , please call maintenance staff.</p> |
| Initialization error : Ethercat is off | Application can't communicate with Ethercat | <ul style="list-style-type: none"> - Close SC application. - Shut down the PC. - Switch off and on the electronic rack (Green button). - Push on blue button on the electronic rack. - Restart PC. - Check on the Ethercat modules (modules behind the |

| | | |
|---|--|--|
| | | <p>electronic rack window); the EK1100 green led must blink quickly.</p> <ul style="list-style-type: none"> - Restart BSSC application. <p>If the problem is always present even after a restart, please call maintenance staff.</p> |
| Initialization error : Other case | / | <ul style="list-style-type: none"> -Close SC application. - Switch off and on the electronic rack (Green button). - Push on the electronic rack blue button. - Restart PC. - Restart BSSC application. <p>Or call maintenance staff.</p> |
| Alarm Serial port time out : - Syringe - Cleaning valve - Water Pump - Detergent pump | Application can't communicate with one of these devices (All of these devices are cabled via an RS485 network) | <ul style="list-style-type: none"> - Click on RESTART button on SC application + select: init hardware. or -Close SC application. -Shut down the PC. - Switch off and on the electronic rack (Green button). - Push on blue the button on electronic rack. - Restart PC. - Restart BSSC application. <p>If the problem is always present even after a restart, please call maintenance staff.</p> |
| Alarm communication time out : OverFlowVenturi | OverFlow venturi is activated but sensor didn't detect vacuum | <ul style="list-style-type: none"> - Check if the cover is well closed. If needed, open and close it again. - Check the air supply pressure on the pressure indictor: must be 5.5 bars (+/-0.5bars). - Check on the fluidic panel (back of the machine) if the Overflow tube is connected correctly. - Click on RESTART button on BSSC application+ select: init hardware. <p>If the problem is always present even if the air supply and the connector are OK: call maintenance staff.</p> |
| Alarm communication time out : PlateTable | SC application can't move Plate Table (Where Samples are) | <ul style="list-style-type: none"> -Check if the cover is well closed. If needed, open and close it again. - Click on RESTART button on BSSC application+ select: init hardware. - Check that the plate table moves (click on <i>Load Position</i> button for example). Or - Click on red button on electronic rack and then on blue one. - Click on RESTART button on BSSC application+ select: init hardware. - Check that the plate table moves (click on <i>Load Position</i> button for example). <p>If after these 3 measures the problem is always present : please call maintenance staff</p> |
| Alarm | Application can't | - Check on the Ethercat modules (modules behind the |

| | | |
|---|--|--|
| communication time out : Twincat PLC | communicate with PLC | electronic rack window) if one or more green led is blinking. - Close BSSC application. - Restart PC and BSSC application. Or - Switch off and on the electronic rack (Green button) - Push on blue button on the electronic rack. - Click on RESTART button on BSSC application+ select: init hardware. If after these 2 measures the problem is always present: call maintenance staff. |
| Alarm : Cover State : Open | Cover of the SC is not closed correctly | -Check if the cover is well closed. If needed, open and close it again. If necessary click on RESTART button on SC application+ select: init hardware. If the problem is always present: call maintenance staff. |
| Alarm : No 24V | Motors power is not activated | - Check if the transparent cover is closed correctly. - Click on the electronic rack blue button. - Click on RESTART button on BSSC application+ select: init hardware. If the problem is always present: call maintenance staff. |
| Alarm : PLC not running | See above: <i>Alarm communication time out : Twincat PLC</i> | See above: <i>Alarm communication time out: Twincat PLC</i> |
| Alarm : Flooding | Presence of liquid in the retention tank of the Fluidic Unit | - Check if there is liquid in the retention tank. if there is not : click on RESTART button on BSSC application+ select : init hardware. Else : - Call the maintenance staff. |
| Alarm : Vacuum | See above : <i>No overflow aspiration alarm</i> | See above: <i>No overflow aspiration alarm.</i> |
| Alarm : Ethercat Off | See above : <i>Initialization error : Ethercat is off</i> | See above: <i>Initialization error : Ethercat is off.</i> |
| Alarm : Water empty | There is not enough water in H2O tank  | - Put distilled water in H2O tank. - Click on restart if necessary. If problem is always present, call the maintenance staff. |
| Alarm : Detergent empty | There is not enough detergent in DETERGENT tank  | - Put DETERGENT in the DETERGENT tank (Available in the beamline). - Click on restart button on BSSC application if necessary. If problem is always present, call the maintenance staff. |
| Alarm : Waste full | The waste tank is full  | - Put gloves and unscrew the head of the WASTE tank. - Change the full tank by an empty one. - Screw the head of the tank. - Click on restart button on BSSC application if necessary. |