



FILTRATION UNIT – “MINI”

Operating instructions

| REV No. | DATE | DESCRIPTION | EDITED | CHD. | APPD. |
|---------|------------|----------------------|--------|------|-------|
| 1.0 | 2023-03-27 | Initial version | SRa | | |
| 1.1 | 2023-06-30 | Additional PTFE-ring | SRa | | |
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SAFETY

You should always plan your work before starting and go through all the safety issues involved. A risk analysis may be required, consult your supervisor or technical staff. Read through the material safety datasheets (MSDS) and use appropriate safety equipment and procedures.

Read carefully through the instructions. If something is left unclear, always ask for further instructions. You are responsible for the safety of yourself, the equipment, and others in the vicinity.

Be careful of chemical residues before and after the process. Clean and dry the parts thoroughly after your work!

Label clearly and store your samples appropriately. Minimum information for labels is full name, contact information, date, and chemical contents.

Use thermal protective gloves when appropriate. The equipment involves pressurized equipment – use the safety covers when operating the piston. When operating the heating unit, make sure the feedback loop between the heating jacket and temperature sensor is realized! Failing to do so may introduce the risk of fire.

Filtration Unit

This filtration unit is designed for mechanically filtering samples of various viscosities and volumes up to 55 ml. Loss of material can build up to approximately 10%.

Image 1 – Filtration unit without safety hood



The feed cylinder is heatable (0-180 °C). The hydraulic piston is operated by a pressured air powered control unit, which can produce pressures up to 300 bar.

Before use

Make sure you have a reservation for the unit. Check the equipment for damage and dirt. Check that the required parts are stored with the unit (See Tools and parts belonging to the unit).

Never use damaged equipment! Report possible damages or missing equipment to the equipment responsible person and your supervisor.

Preparations

For filtering, prepare a round disc of chosen filtration material. Make use of the breaking plate (See Image 3) as template, marking a circle on the material. Cut the material with appropriate shears inside the circle to make it a bit smaller than the actual breaking plate.

Due to filtration materials conforming to the shapes, the edge of the material will recede a bit when the assembly is tightened. Nevertheless, the cut filter disc must never go over the protruding profile highlighted in Image 2.

Image 2 -

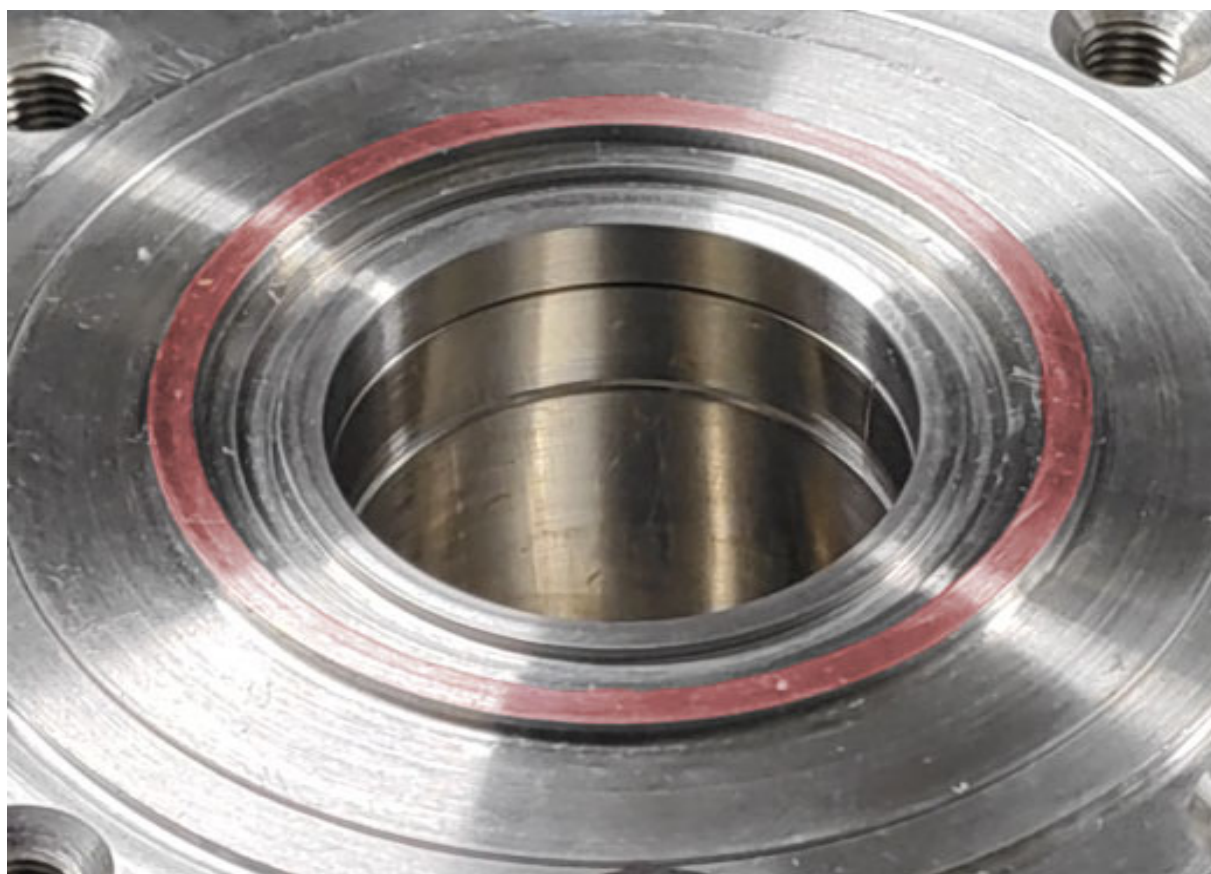


Image 3 – Breaker plate viewed from bottom side

Move the local exhaust ventilation head over the unit. Make sure the ventilation is on (in some models there is a mechanical switch on the arm).

Turn on the heating jacket controller (Image 4) from the power switch. After the controller has initialized, it will start powering the heating jacket. By default, it shows the measured sensor temperature.

Image 4 – Heating controller unit

To adjust the temperature controller setpoint, press once the P-button. Display will alternate between the text *P1* and the current setpoint. Use the arrow buttons to increase/decrease the temperature setpoint. After a delay, it will return to the main view showing the measured temperature.

Let the temperature stabilize before continuing. Actual temperature inside the feed cylinder will be XX degrees less than the setpoint

Screw the attaching ring on the filtrate cylinder to the cover as shown in Image 5. It does not have to be tight but rotate it all the way it goes.

Image 5 – Filtrate cylinder safety cover installation



Filtering

Open the safety hood by turning it counter-clockwise (Image 6).

Image 6 – Safety hood in closed position



If the mechanical lock of the piston control unit (Image 7) is engaged (locking switch in the centre is in upper position), the piston cannot be moved. Disengage it by turning the centre switch down. This should release the *RELEASE* pedal to upper position.

Image 7 – Piston control unit (Enerpac XA11G)

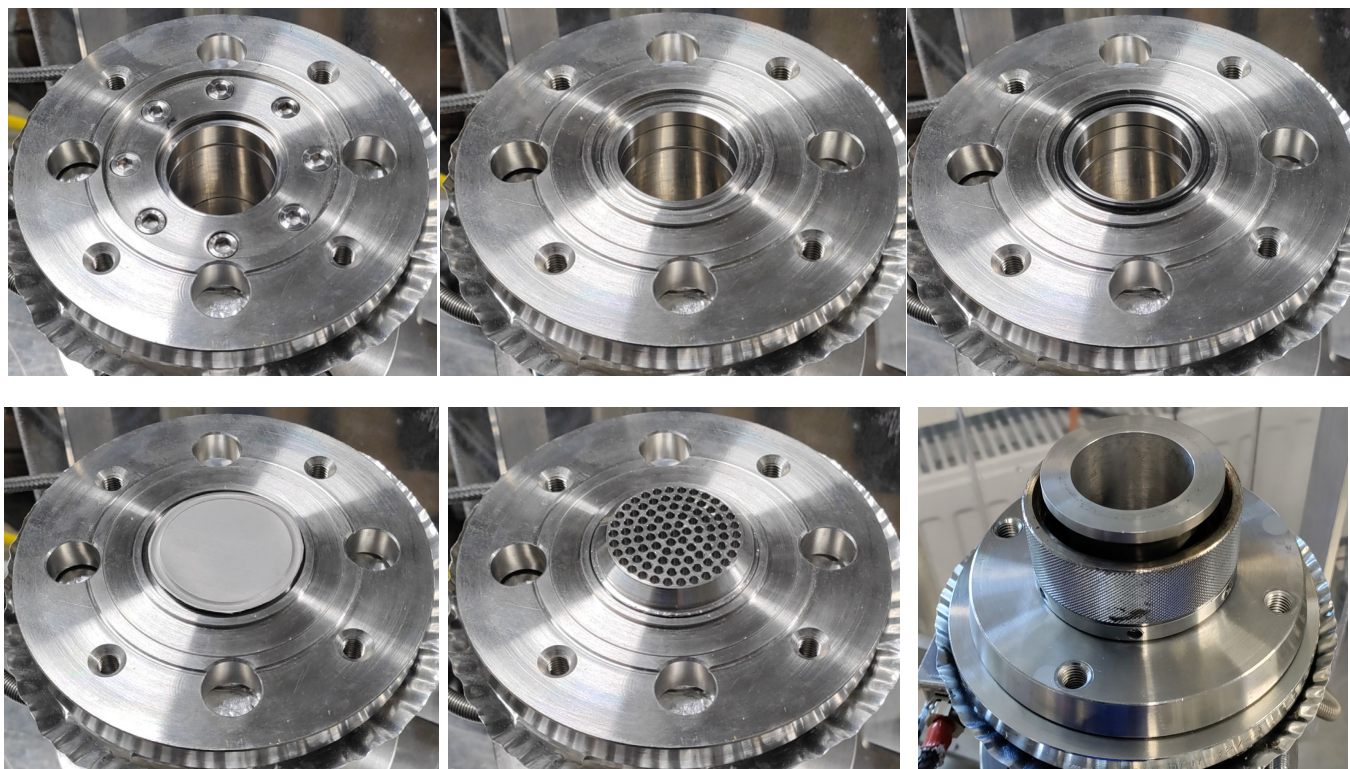


Ensure there is enough space for your sample in the feed cylinder. You move the piston down by pushing on the *RELEASE* pedal on the piston control unit. Move it up by pushing on the *PRESSURE* pedal. Insert the sample.

If for some reason you see the 8 bolt heads on top of the filtration unit, the metal insert has been removed – insert it before continuing. Insert the o-ring in the groove of the metal insert. Place the cut filtration disc on top, making sure it does not go over the profile on the insert. The breaker plate with its broader end down goes on top of that and should similarly stay inside the profile. (See Image 8)

Place the filtrate cylinder with the safety cover on top. Align the bolt holes with the holes in the main frame. Insert and tighten the bolts first just by hand making sure the cover is level with the bottom. Then tighten the bolts with the hexagonal Allen key.

Image 8 – Assembling the unit for filtration



Close and keep the safety hood closed during filtration. Continue to filter the sample by pushing on the *PRESSURE* pedal on the piston control unit. The pedal is responsive, so if you wish to go slower, use little force and small movements.

Turn off the heating jacket controller!

Depending on your sample you may choose alternative ways of collecting it from the filtrate cylinder.

Cleaning

Never pour water or other solvents inside the feed cylinder, as there is the risk of leakage. Use only moist tissues if liquids are required for cleaning the non-detachable parts.

If you haven't detached the filtrate cylinder already, do it now. You can clean all the detachable parts separately. Use water, and if need be, ethanol. Acetone may damage the filtrate cylinder cover window. Dry the parts after cleaning.

Clean the top of the feed cylinder and piston. Lower the piston to the lowest position and clean the walls of the cylinder. Raise the piston all the way up and repeat these cycles until no residue is left. Finally leave the piston at lowest position.

Return the clean and dry parts to the unit. Replace the tools and bolts.

Push on *RELEASE* pedal on the piston control unit and simultaneously push the locking switch in. The pedal should lock in its lower position.

Tools and parts belonging to the unit

Tools

- Allen key, hex
- 4 Allen head bolts

Detachable parts

- Filtrate cylinder (See Image 5)
- Filtrate cylinder cover (See Image 5)
- Breaker plate (See Image 3)
- O-ring