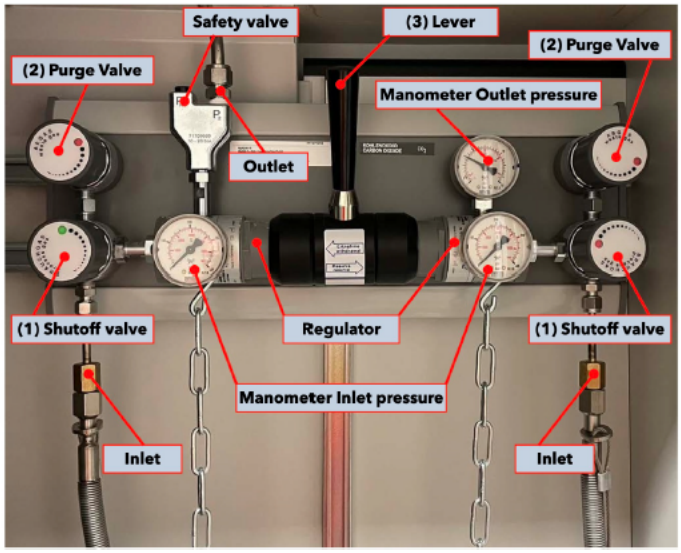
Cylinder replacement procedure for flammable, oxidizing and inert gases[1]



Go to the gas safety training

1. Preparation

1.1 Follow the instructions given in EPFL's gas safety training.
1.2 Don't open or close valves other than stated.
1.3 Identify the empty cylinder: the manometer inlet pressure shows low or zero pressure [2].
1.4 Move lever (3): the arrow "withdrawal" indicates the full cylinder.
1.5 Close shutoff valve (1) of the empty cylinder.
1.6 Close the cylinder valve on the empty cylinder.
1.7 Slowly open purge valve (2) on the side of the empty cylinder to evacuate the residual pressure. The manometer inlet pressure now shows zero pressure.
1.8 Close purge valve (2).

2. Cylinder replacement

2.1 Disconnect the hose of the empty cylinder, you could gently use a wrench **(non-sparkling wrench in case of flammable gas)**, but if the hose cannot be easily disconnected, it might still be under pressure, so go back to step 1. Check the O-ring and replace it, if necessary.
2.2 Protect the hose against mechanical shocks (i.e. folding, torsion, contact with the floor or sharp edges). **WARNING:** Damaged hoses cannot be used and must be replaced.
2.3 Before connecting the hose of the full cylinder, verify that the O-ring is in good conditions. Wrap around the bottle valve the security cable of the flexible hose, so that, it will get secured by the hose (see gas safety training).
2.4 Connect the hose of the full cylinder and tighten it firmly by hand. If the clamp is made of plastic, do not use any tools to tighten it further. If not made of plastic, and if necessary, you might use a wrench **(non-sparkling wrench in case of flammable gas)** to finish tightening: ¼ of a tour is enough. If you apply more force than that, you risk damaging the O-ring, eventually causing gas leaks.

3. Purge of the high-pressure part of the installation (on the side of the empty cylinder)

3.1 **Slowly**[3] open the cylinder valve and close it again.
3.2 Wait about 30 seconds for the remaining air to mix with the gas.
3.3 **Slowly**[3] open purge valve (2), close it again when manometer inlet pressure shows about 10 bar.
3.4 Repeat this cycle three to five times (steps 3.1 to 3.3), depending on the required purity.
3.5 **Slowly**[3] open the cylinder valve and shutoff valve (1).

4. Final check

4.1 Check the pressure, is everything tight?
4.2 The cylinder valve and the shutoff valve (1) must be open.
4.3 The arrow "withdrawal" of the lever (3) indicates the cylinder in use.
4.4 Perform a leak test.

[1] The procedure as well as the training for the replacement of toxic gas cylinders must be provided by the installer of the gas distribution system.

[2] For gas distribution systems without a changeover switch, proceed directly to point 1.5

[3] Pressure blows are a safety risk and damage equipment