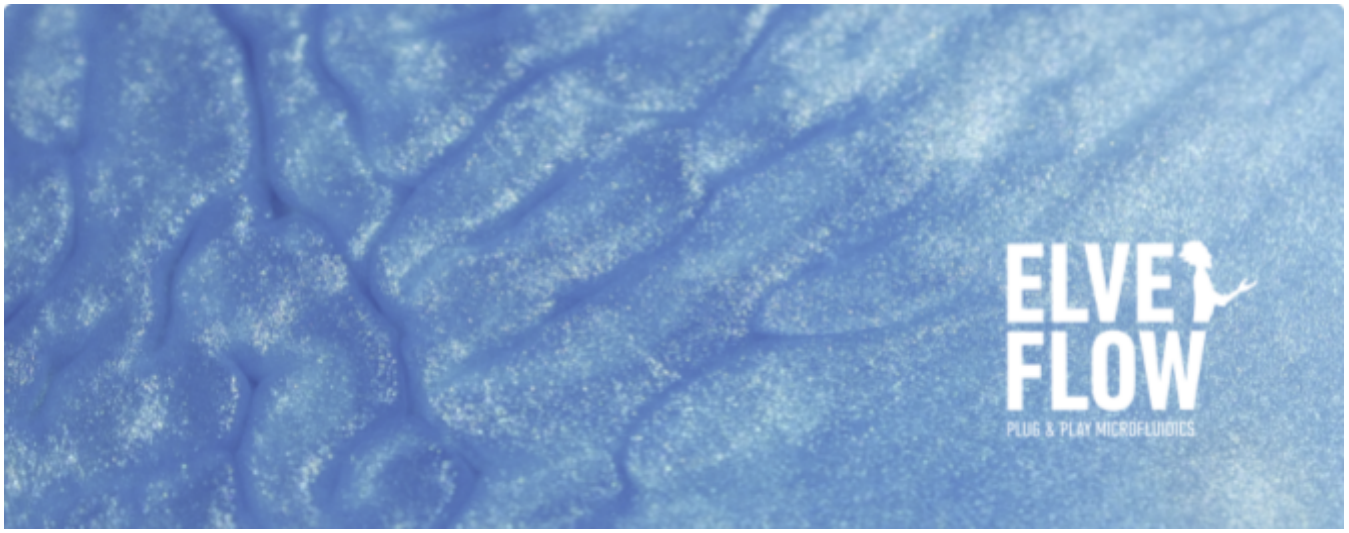


Pressurized reservoirs

User Guide

Outline

Working Principle 2

Pressure ranges compatibility 3

Security recommendation 4

Usage recommendations 4

Assembling and using your reservoir 5

- **Kit Reservoir Tank XXS on Chip** 5
- **Kit Reservoir Tank XS - 1.5mL** 7
- **Kit Reservoir Tank S - 2 or 4 ports 15mL** 9
- **Kit Reservoir Tank M - 2 or 4 ports 50mL** 11
- **Kit Reservoir Tank L - 2 or 4 ports 100mL** 13
- **Kit Reservoir Tank L High Pressure - 2 ports - 150mL** 15
- **Kit Reservoir Holder Rack 4-XS - 2 ports - 1.5mL or 15mL or 50 mL** 17

Elveflow proposes a range of pressurized tanks of various volumes to address all user experimental needs, from 800 uL to 150 mL. Some versions are available with 2 and 4 ports.

The table below details the features of available Elveflow Pressurized Reservoirs

	volume	2 ports	4 ports
XXS	800 uL	NA	NA
XS	1,5-2 mL	available	x
S	15 mL	available	available
M	50 mL	available	available
L	100 mL	available	available
HP	150 mL	available	x

1. Working Principle

On all pressurized tanks, one port is used to pressurize (resp. depressurized) the reservoir content relatively to the atmospheric pressure and is connected to the output of the pressure controller. The second port of the reservoir serves as the reservoirs outlet (resp. inlet). A tubing plunged into the liquid allows the liquid to go out (sep. inside) of the reservoir once it is pressurized (resp. depressurized).
Additional ports can be used to add inputs or outputs for instance to implement a reservoir automatic refill process.

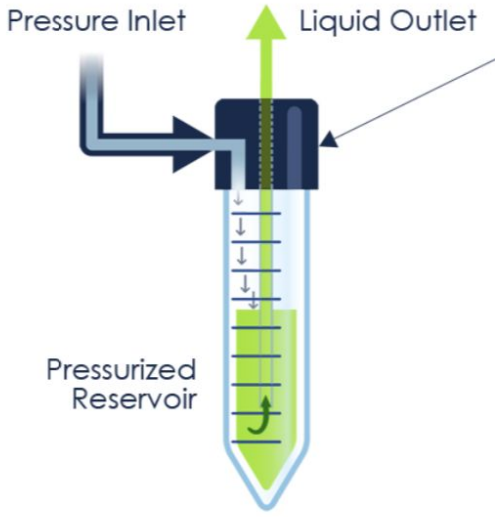


Figure: working principle of a two ports pressurized reservoir

2. Pressure ranges compatibility

Before using one pressurized tank, one must verify its compatibility with the pressure range that is going to be used during the experiment. The table below details which reservoir can be used with the different output pressure ranges of the OB1 pressure controller. If pressure exceeds recommended pressure range, there is risk of explosion of the reservoir. Elveflow is not responsible of any damage caused by a misuse of a reservoir causing it to explode.

Important note: This compatibility table applies only if Elveflow recommendations (see corresponding section of this user guide) are respected (reservoirs are not damaged and the proper tubes or bottles are used with the caps).

Pressurized Tank version	**Pressure channel range**				
	0-200 mbar	0-2 bar	0-8 bar	-900 mbar/+1 bar	-900 mbar/+6 bar
XXS	ok	nok*	nok*	nok*	nok*
XS	ok	ok	ok	ok	ok
S	ok	ok	ok	ok	ok
M	ok	ok	ok	ok	ok
L	ok	ok	nok**	ok	nok**
HP	ok	ok	ok	ok	ok

*not tested in these conditions, **the reservoir passed the pressure resistance tests in these conditions, nevertheless Elveflow doesn't recommend to use it as they are sensitive to mechanical damages.

Pressure resistance tests have been conducted on the pressurized tanks. Protocols and results of the tests are available upon request.

3. Security recommendation

Working with systems or equipment containing liquids or gases under pressure can entail risks, especially with pressurized reservoirs containing corrosive, toxic or explosive liquids and even with water. Due to the nature of the materials used, transport, and handling of reservoirs by the end user, Elveflow cannot guarantee the integrity and strength of the provided reservoirs beyond atmospheric pressure.

- **Do not use a tube or a bottle that looks damaged** or has encountered a shock.
- **Use only the same tube references** if you need a spare one. The pressure resistance tests were conducted only on the tubes and bottles references provided by Elveflow with the cap. Mechanical resistance features may vary with the material of the tube or bottle of other references. Elveflow cannot guarantee that other references of tubes or bottles used by the end-user will withstand the same pressure ranges.

- Chemical compatibility and temperature. **The user MUST ensure that the tube/bottle he is using with Elveflow pressurized tube cap is adapted to its experimental condition**s (chemical compatibility of the material, resistance to temperature, ...) to fulfill security requirements. Elveflow cannot guarantee the reservoir strength upon the usage of the end-user and cannot be held responsible for damage or injuries related to user specific experimental conditions.

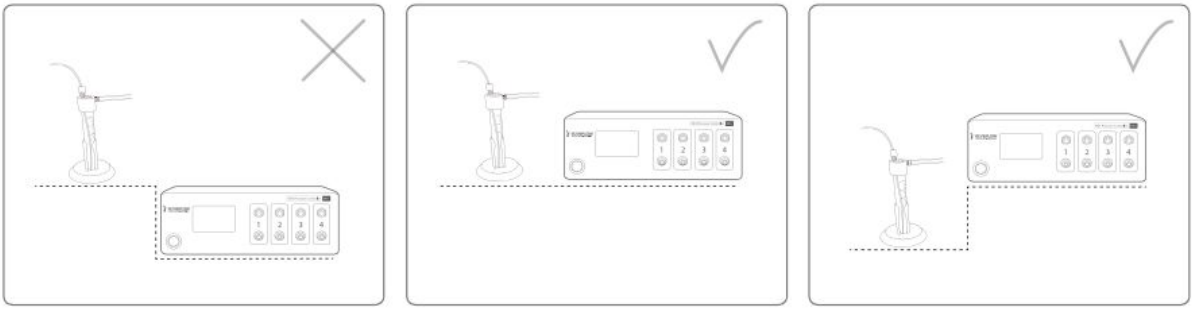
- Elveflow **recommends to use security equipments adapted to specific experimental conditions** using pressurized reservoirs containing liquid and presenting explosion risk (protection glasses, security net or shield). Depending on the nature of the liquid it is the user responsibility to use indicated security equipment (PPE, chemical hood, ...).

4. Usage recommendations

- Check before use that the seal is undamaged properly positioned in the groove inside the cap. Spare seal can be purchased upon request.

- It is recommended to put one or two layers of teflon thread seal tape around the ¼ 28'' connectors screwed in the pressurized reservoir cap. It improves the sealing and reduces the chances of leaks.

- It is recommended to place the pressure controller above the reservoirs to prevent backflow into the pressure controller channel that would damage it.



- Be aware that the hydrostatic pressure generated by the liquid column in the reservoir is added to the pressure of the the gas/liquid interface (for water, 1 cm of liquid corresponds to an hydrostatic pressure of approximately 1 mbar).

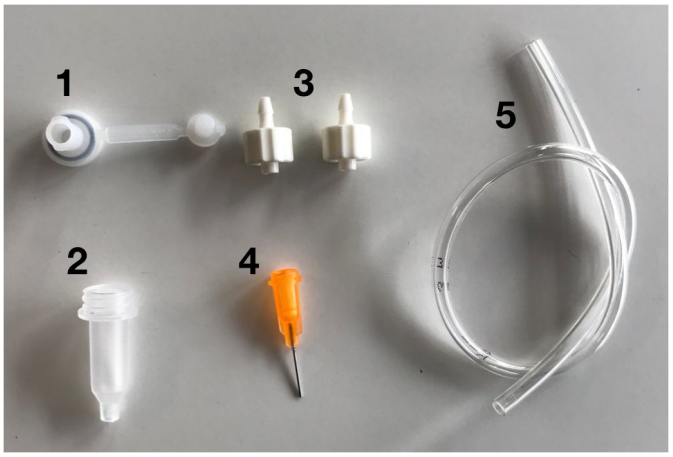
- Before opening on pressurized tank, you must set the pressure of the reservoir to atmospheric pressure (pressure command to zero) to avoid any liquid spill, material damage or injuries.

5. Assembling and using your reservoir

5.1. Kit Reservoir Tank XXS on Chip

5.1.1. Needed materials

The picture below illustrates the elements needed to assemble the reservoir.



1. Cap the XXS reservoir, verify that the o-ring is properly placed
2. XXS tube
3. 2 male Luer Integral Lock to 3/32'' OD Barb
4. Needle Tip 23G 1/2“ blunt end
5. Tubing 4mm OD

5.1.2. Assembly

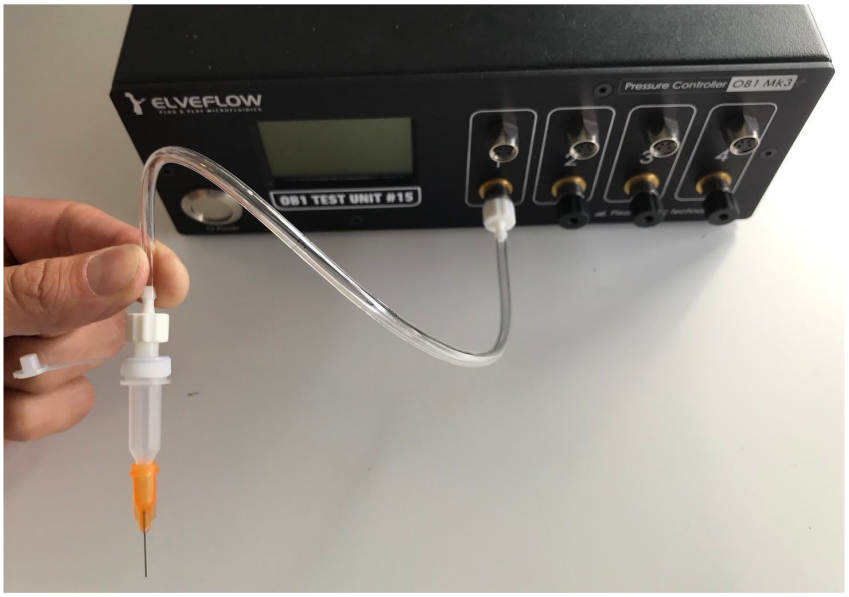
The steps to follow to assemble the reservoir are presented below:




- Screw the cap on the tube
- adapt the needle tip at the bottom of the tube
- Adapt the 2 male Luer Integral Lock to 3/32'' OD Barb to the extremities of the 4 mm OD tubing

5.1.3. Use

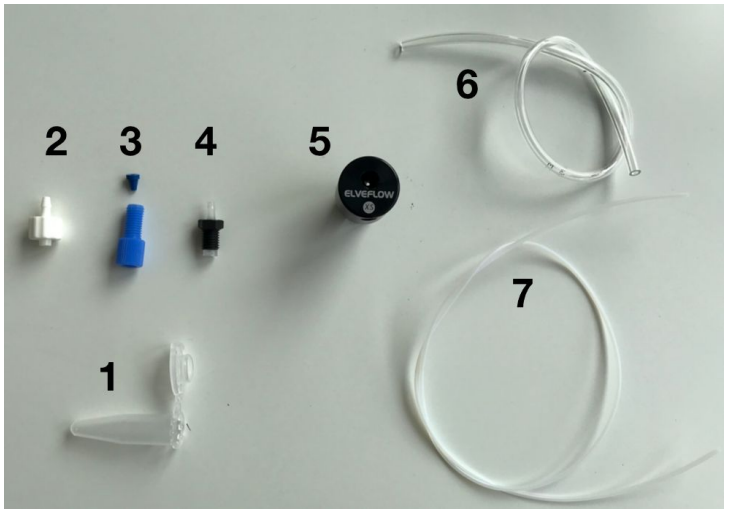
The pneumatic tube can then be connected to the pressure controller output (following the instruction of the OB1 User guide).



5.2. Kit Reservoir Tank XS - 1.5mL

5.2.1. Needed materials

The picture below illustrates the elements needed to assemble the reservoir.

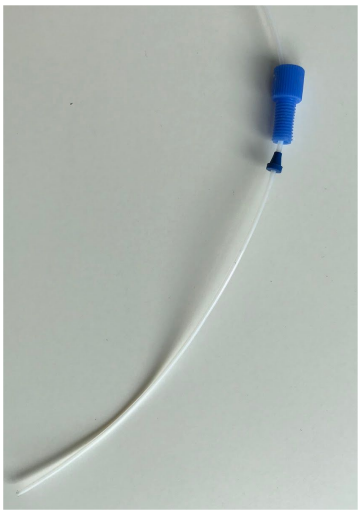


1. 1,5 mL Eppendorf® tube
2. Male Luer Integral Lock to 3/32'' OD Barb
3. Teflon end fittings with 1/4''-28 thread with Ferrules for 1/16 OD (1.6mm) Tubing
4. 1/4-28 UNF Thread to 3/32'' OD Barb
5. XS cap for pressurized reservoir
6. Tubing 4mm OD
7. 1/16” (1.6mm) OD Tygon or PTFE tubing

5.2.2. Assembly

The steps to follow to assemble the reservoir are presented below:






- Unscrew the XS cap to place the eppendorf tube between the 2 pieces of the cap
- Screw the two parts of the cap to ensure a perfect seal
- Place the ¼ 28'' fitting and ferrule on the 1/16''OD tubing, set the length in order to have the tubing touching the bottom or the reservoir
- Screw the ¼ 28'' fitting in the top port of the cap to ensure a perfectly sealed connection
- Screw the 1/4-28" to 3/32'' OD Barb in the second port (lateral) of the cap to ensure a perfectly sealed connection
- Adapt the 4mm OD tubing to the barb
- Adapt the Male Luer Integral Lock to 3/32'' OD Barb to the other extremity of the 4 mm OD tubing (not necessary if the pressure controller channel has push-in connection

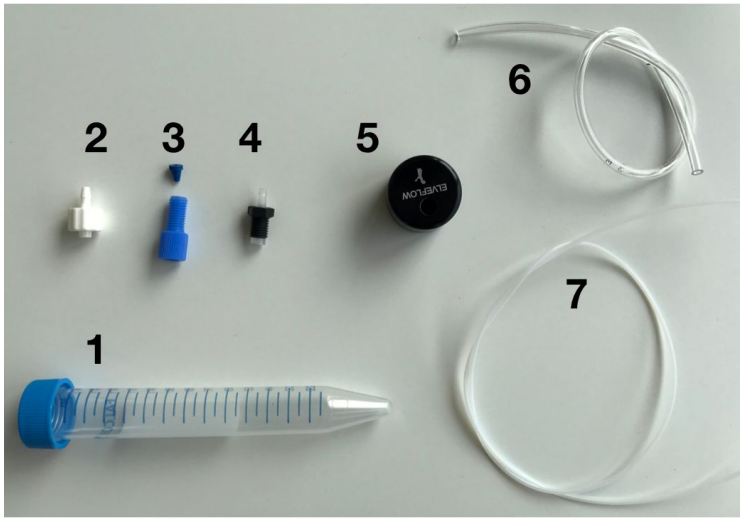
5.2.3. Use

The pneumatic tube can then be connected to the pressure controller output (following the instruction of the OB1 User guide).

5.3. Kit Reservoir Tank S - 2 or 4 ports 15mL

5.3.1. Needed materials

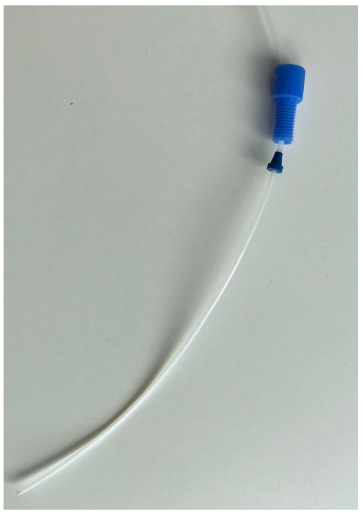
The picture below illustrates the elements needed to assemble the reservoir.



1. 15 mL Falcon® tube
2. Male Luer Integral Lock to 3/32'' OD Barb
3. Teflon end fittings with 1/4''-28 thread with Ferrules for 1/16 OD (1.6mm) Tubing
4. 1/4-28 UNF Thread to 3/32'' OD Barb
5. S cap for pressurized reservoir
6. Tubing 4mm OD
7. 1/16” (1.6mm) OD Tygon or PTFE tubing

5.3.2. Assembly

The steps to follow to assemble the reservoir are presented below:




- Screw the cap on top of the Falcon® tube
- Place the ¼ 28'' fitting and ferrule on the 1/16''OD tubing, set the length in order to have the tubing touching the bottom or the reservoir
- Screw the ¼ 28'' fitting in the top port of the cap
- Screw the 1/4-28 to 3/32'' OD Barb in the second port (lateral) of the cap
- Adapt the 4mm OD tubing to the barb
- Adapt the Male Luer Integral Lock to 3/32'' OD Barb to the other extremity of the 4 mm OD tubing (not necessary if the pressure controller channel has push-in connection

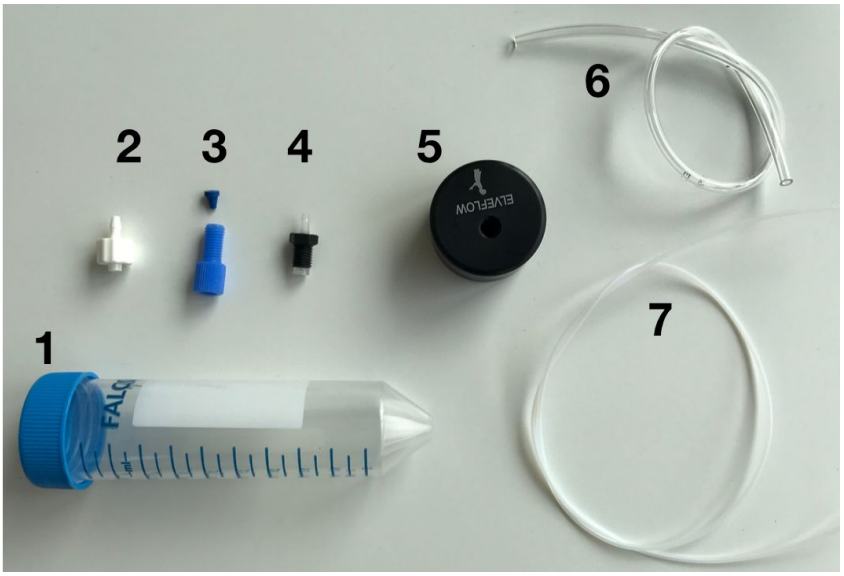
5.3.3. Use

The pneumatic tube can then be connected to the pressure controller output (following the instruction of the OB1 User guide).

5.4. Kit Reservoir Tank M - 2 or 4 ports 50mL

5.4.1. Needed materials

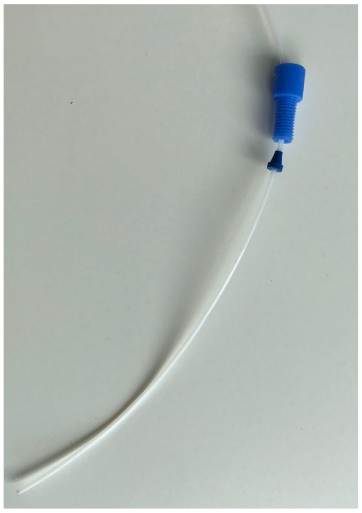
The picture below illustrates the elements needed to assemble the reservoir.



1. 50 mL Falcon® tube
2. Male Luer Integral Lock to 3/32'' OD Barb
3. Teflon end fittings with 1/4''-28 thread with Ferrules for 1/16 OD (1.6mm) Tubing
4. 1/4-28 UNF Thread to 3/32'' OD Barb
5. M cap for pressurized reservoir
6. Tubing 4mm OD
7. 1/16” (1.6mm) OD Tygon or PTFE tubing

5.4.2. Assembly

The steps to follow to assemble the reservoir are presented below:




- Screw the cap on top of the Facon tube
- Place the ¼ 28'' fitting and ferrule on the 1/16''OD tubing, set the length in order to have the tubing touching the bottom or the reservoir
- Screw the ¼ 28'' fitting in the top port of the cap to ensure a perfectly sealed connection
- Screw the 1/4-28 to 3/32'' OD Barb in the second port (lateral) of the cap to ensure a perfectly sealed connection
- Adapt the 4mm OD tubing to the barb
- Adapt the Male Luer Integral Lock to 3/32'' OD Barb to the other extremity of the 4 mm OD tubing (not necessary if the pressure controller channel has push-in connection

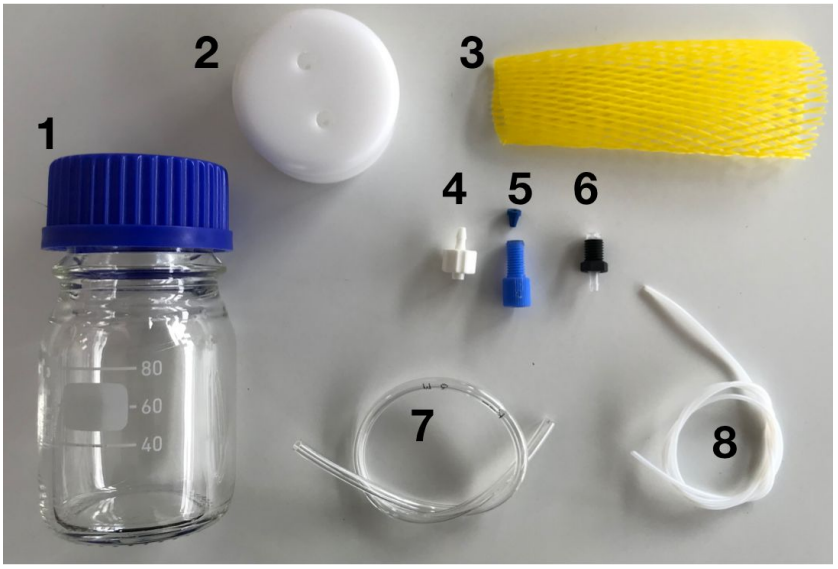
5.4.3. Use

The pneumatic tube can then be connected to the pressure controller output (following the instruction of the OB1 User guide).

5.5. Kit Reservoir Tank L - 2 or 4 ports 100mL

5.5.1. Needed materials

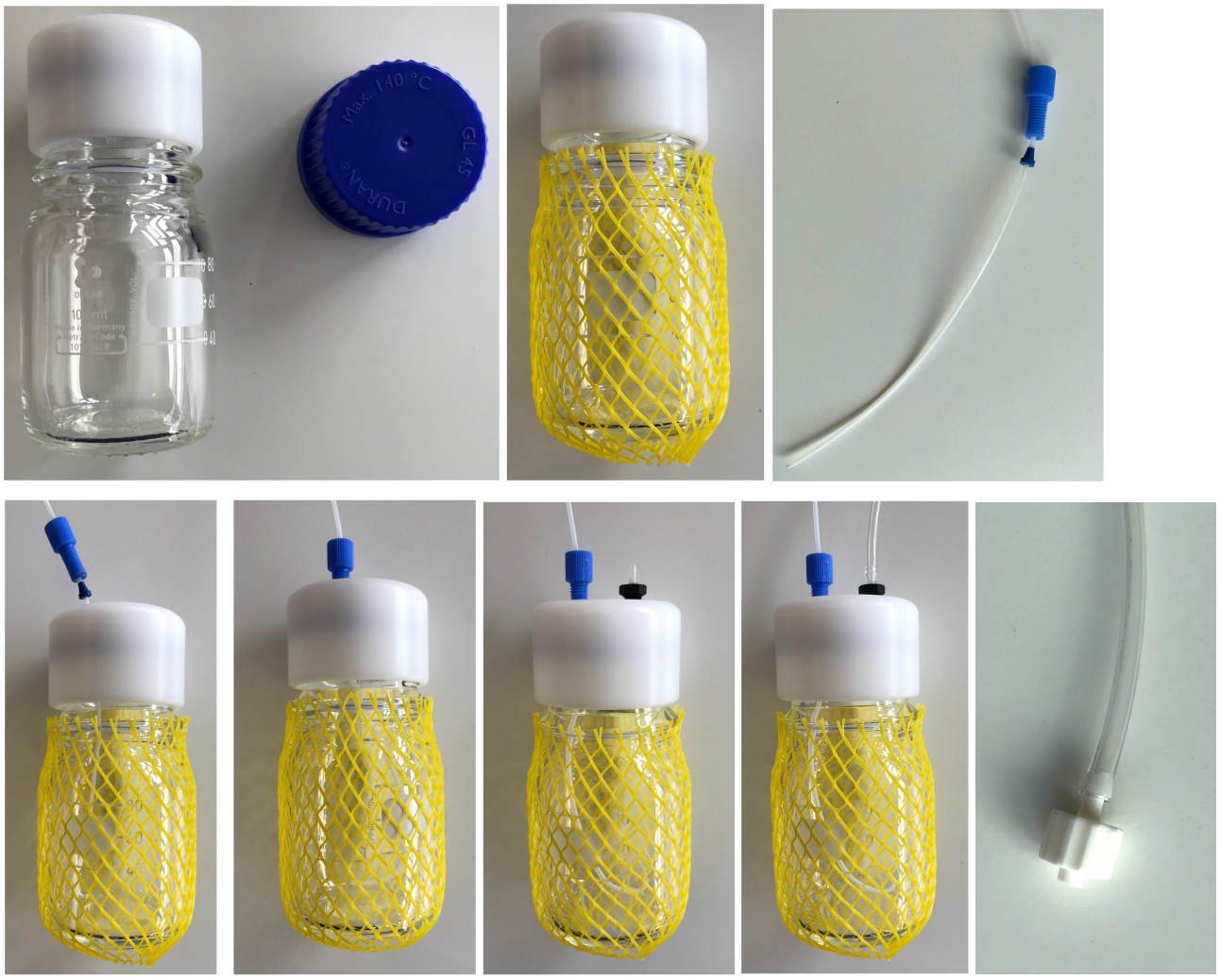
The picture below illustrates the elements needed to assemble the reservoir.



1. 100 mL bottle
2. L cap for pressurized reservoir
3. protective net
4. 1/4-28 UNF Thread to 3/32'' OD Barb
5. Teflon end fittings with 1/4''-28 thread with Ferrules for 1/16 OD (1.6mm) Tubing
6. Male Luer Integral Lock to 3/32'' OD Barb
7. Tubing 4mm OD
8. 1/16” (1.6mm) OD Tygon or PTFE tubing

5.5.2. Assembly

The steps to follow to assemble the reservoir are presented below:



- Screw the cap on top of the bottle
- Adapt the protective net around the bottle
- Place the ¼ 28’’ fitting and ferrule on the 1/16’’OD tubing, set the length in order to have the tubing touching the bottom or the reservoir
- Screw the ¼ 28’’ fitting in one of the ports of the cap to ensure a perfectly sealed connection
- Screw the 1/4-28 to 3/32" OD Barb in the second port of the cap to ensure a perfectly sealed connection
- Adapt the 4mm OD tubing to the barb
- Adapt the Male Luer Integral Lock to 3/32" OD Barb to the other extremity of the 4 mm OD tubing (not necessary if the pressure controller channel has push-in connection

5.5.3. Use

The pneumatic tube can then be connected to the pressure controller output (following the instruction of the OB1 User guide).

5.6. Kit Reservoir Tank L High Pressure - 2 ports - 150mL

5.6.1. Needed materials

1. 100 mL bottle
2. Cap for pressurized reservoir
3. protective net
4. 1/4-28 UNF Thread to 3/32'' OD Barb
5. Teflon end fittings with 1/4''-28 thread with Ferrules for 1/16 OD (1.6mm) Tubing
6. Male Luer Integral Lock to 3/32'' OD Barb
7. Tubing 4mm OD
8. 1/16” (1.6mm) OD Tygon or PTFE tubing
9. Bottle holder

5.6.2. Assembly

The steps to follow to assemble the reservoir are presented below:

- Put teflon thread seal tape around the thread of the cap
- Screw the cap on top of the bottle
- Adapt the protective net around the bottle
- Place the ¼ 28'' fitting and ferrule on the 1/16''OD tubing, set the length in order to have the tubing touching the bottom or the reservoir
- Screw the ¼ 28'' fitting in one of the ports of the cap to ensure a perfectly sealed connection
- Screw the 1/4-28 to 3/32" OD Barb in the second port of the cap to ensure a perfectly sealed connection
- Adapt the 4mm OD tubing to the barb
- Adapt the Male Luer Integral Lock to 3/32" OD Barb to the other extremity of the 4 mm OD tubing (not necessary if the pressure controller channel has push-in connection

5.6.3. Use

The pneumatic tube can then be connected to the pressure controller output (following the instruction of the OB1 User guide).

5.7. Kit Reservoir Holder Rack 4-XS - 2 ports - 1.5mL or 15mL or 50 mL

For these versions of the pressurized reservoir (pictured below), the same instructions and recommendations (as the ones of the single pressurized reservoirs of the same volume) apply.