

## Scope of delivery

Accessories kit	Comment
Column holder	
Base plate	
Double offset screwdriver, size 8 mm, chrome-plated	Tool for mounting the rack
Couplings (tube-side) with safety valve	
Coolant tube	Outer diameter 8 mm, inner diameter 6 mm, thickness 2 mm
Insulation tube	Outer diameter 35 mm, inner diameter 16 mm, thickness 9 mm

## Intended use

The benchtop cooling is designed to cool up to 3 MPLC glass columns from the KNAUER Bioline product series.

Only use the benchtop cooling for laboratory operation.

Always have the benchtop cooling installed and operated by trained technicians, e. g. chemical engineering assistants.

## Necessary tools

- Double offset screwdriver, size 8 mm (included)
- Allen wrench
- Knife for trimming the tubing



**Warning!** Back injuries due to heavy lifting. Never carry or assemble the Bioline rack on your own. Always have several people assist you in carrying the Bioline rack, whether for installation, transportation or storage!



## Assemble the Bioline Rack

The Bioline Rack is shipped in two packages. To assemble the Bioline Rack, fasten the column holder to the base plate with 4 Allen screws. The 4 Allen screws and an intermediate plate have been screwed into a base.

## Level of difficulty of the assembly

Level 3 (1 = very easy to 7 = very difficult)

Duration: 45 minutes.

# 1

## Mounting the column holder to the base plate

1. Place the base plate face up on a table, so that the rear part of the plate juts out from the table and can be accessed from below.
2. Loosen four Allen screws ① and the intermediate plate ② from the base plate.
3. Slide the front edge of the column holder between the intermediate plate ② and base plate.
4. Tighten the four Allen screws ① using the included screwdriver.

The Bioline rack is mounted.

## Intermediate result:

The Bioline rack is mounted. The Bioline glass columns can be fastened to the Bioline rack.

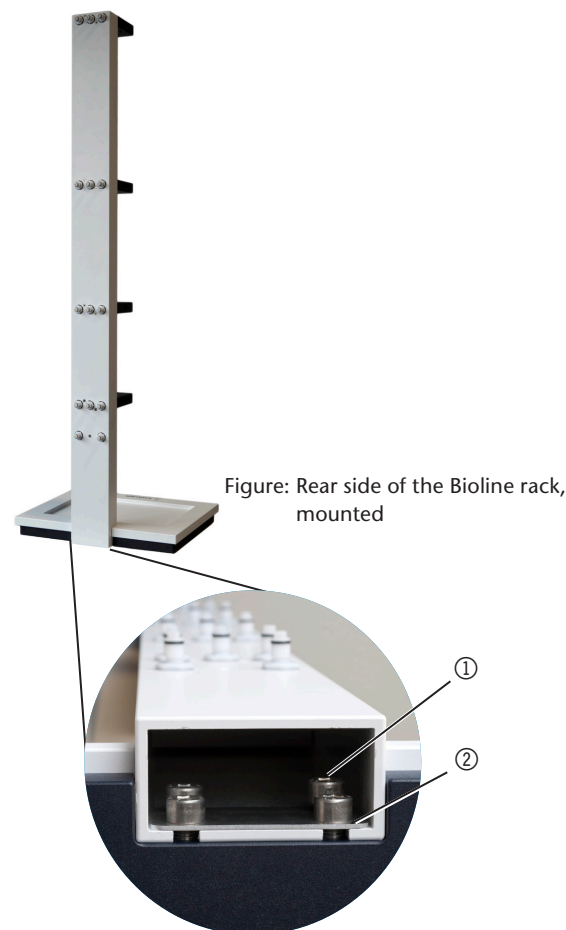


Figure: View into the Bioline rack from below

# 2

## Mounting the glass column to the rack

1. Mount the glass columns ① according to the assembly instructions for glass columns and screw in the fastening rods ②.
2. Insert the fastening rods ② on the glass columns into the opening on the Bioline rack.
3. Fasten the fastening rods in place using the Allen screw ③.

## Intermediate result:

The Bioline glass columns are fastened to the Bioline rack.

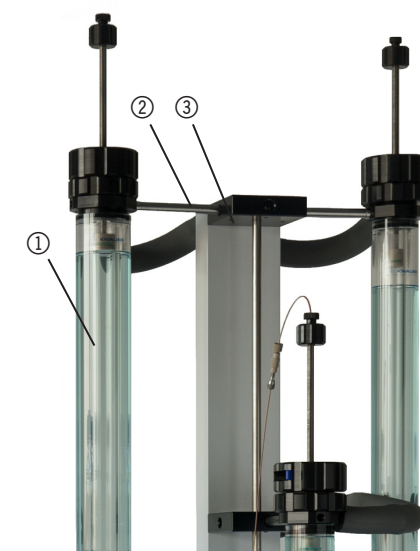


Figure: Glass columns fixed to Bioline rack

## Connect the tube for the coolant

Connect the Bioline Rack and the other modules according to the following schematic diagram.

Remove the connection piece on the side of the tube from the accessories kit.

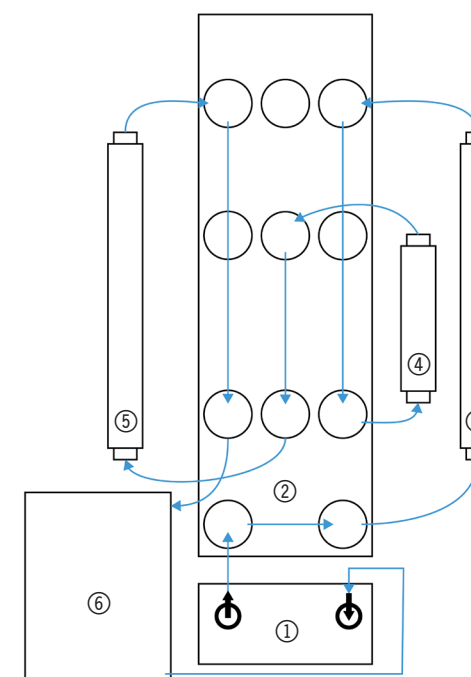


Figure: Schematic diagram of the cooling circuit

①	Thermostat
②	Bioline MPLC rack
③	Bioline glass column 1
④	Bioline glass column 2
⑤	Bioline glass column 3
⑥	Fraction collector

# 3

## Preparing the tubing for the coolant

1. Take the tube for the coolant ① out of the accessories kit and slide the tube onto the tube-side connection piece ③.
2. Use a cable tie ② to fasten the tube in place.
3. Slide the insulation tube ④ onto the tube for the coolant.

## Intermediate result:

The tubing for the coolant can be connected.

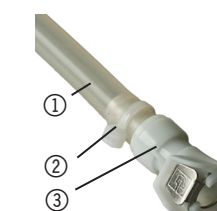


Figure: Connection piece with tube for the coolant

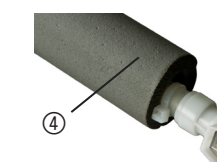


Figure: Connection piece with tube for the coolant and insulation tube



Figure: Bioline system without the thermostat

## The benchtop cooling system

The benchtop cooling system provides cooling for the filtration processes conducted for medium-pressure liquid chromatography. By means of external thermostats, the Bioline glass columns can be tempered to a range of temperatures, from 2 °C. A total of 3 Bioline glass columns can be mounted to the column stand, which will be referred to as the "Bioline Rack" in the following. It is also possible to integrate a fraction collector in the cooling circuit.

### Cooling by means of thermostats

Up to 3 Bioline glass columns with tempering jackets, the Bioline rack and a fraction collector can be cooled simultaneously by a thermostat.

The use of an additional cooling room or refrigerator is not necessary. Only a small amount of space is required.

### Leak protection

The connection pieces for the cooling system on the Bioline rack and the tube-side connection pieces are equipped with safety valves. The tubes for the coolant can be disconnected without risk of liquid leaking out. The connection pieces on the tube-side and on the rack automatically close as soon as the connections are separated.

#### Preconditions for operation

- Bioline rack has a stable supporting surface
- Connection to a thermostat

## 4 Connecting the tubing for the coolant to the Bioline rack

Caution! Danger of leaks. Do not, for any reason, unscrew the connection pieces from the Bioline rack. The rack will no longer be free of leaks.

Connect the tube-side connection with the tubing on the Bioline rack.



Figure: Rack-side connection piece on the rear side of the Bioline rack

## 5 Connecting the tube for coolant to the Bioline glass columns and the fraction collector

The inlet and outlet connections for cooling the Bioline glass columns and fraction collector have an olive-type tube fitting.

1. Slide the tube for the coolant onto the olive-type tube fitting.
2. Fasten the tube in place using a cable tie.
3. In order to provide good insulation, slide the insulation tube over the olive-type tube fitting.
4. Connect the fraction collector at the end of the cooling chain in the same manner.
5. Connect the cooling circuit to the thermostat.

Result: The cooling circuit is established.



Figure: Olive-type tube fitting

## Initial startup of the cooling system

Before operating or filling the thermostat, see the manufacturer's operating manual, particularly the warnings and safety advice.

## 6 Starting up the cooling system

1. Select the desired target temperature on the thermostat display.
2. Set the speed of the thermostat pump so that there will be sufficient flow in the system.

For additional information, see the operating manual for the thermostat.

### Requirements for the thermostat

Heating/cooling capacity	2 °C-60 °C
Flow rate (outlet pressure)	27 liter/minute
Head (outlet pressure)	70 kPa
Flow rate (suction)	20 liter/minute
Head (suction)	40 kPa

### Technical data

Weight	27.4 kg
Dimensions (width × height × depth)	60 cm × 130 cm × 40 cm
Temperature range	2 °C-60 °C

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