IC Equipment Set

Flow Cell for Bioscan – 6.5331.0X0

Manual

8.110.8003EN / 2019-09-25

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This documentation has been prepared with great care. However, errors can never be entirely ruled out. Please send comments regarding possible errors to the address above.

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1 Introduction

1.1 Description

The flow cell is used for amperometric detection with the Bioscan measuring instruments. The flow cell's construciton is based on the Wall-Jet-Principle. According to the Wall-Jet-Principle the inlet is positioned exactly opposite to the working eleoctode, which allows for optimum measuring perfomance.

The flow cell is available in four versions:

- Gold flow cell (6.1254.010)
- Glassy carbon flow cell (6.1254.050)
- Platinum flow cell (6.1254.060)
- Silver flow cell (6.1254.070)

For a more detailed description of the specification and intended use of the individual cells, please see *(see chapter 3, page 6)*.

1.2 About the Documentation

CAUTION

Please study this documentation carefully before you start to use the instrument. The documentation contains information and warnings that must be observed by the user in order to guarantee the safe use of the instrument.

1.2.1 Symbols and conventions

The following symbols and styles are used in this documentation:

*(5-**12**)*	**Cross-reference to figure legend** The first number refers to the figure number, the second to the instrument part in the figure.
1	**Instruction step** Carry out these steps in the sequence shown.
	**Warning** This symbol draws attention to a possible life hazard or risk of injury.

	**Warning** This symbol draws attention to a possible hazard due to electrical current.
	**Warning** This symbol draws attention to a possible hazard due to heat or hot instrument parts.
	**Warning** This symbol draws attention to a possible biological hazard.
	**Caution** This symbol draws attention to a possible damage of instruments or instrument parts.
	**Note** This symbol marks additional information and tips.

2 Installation

CAUTION

Never switch on the flow cell when it is..

- ..not being rinsed through with a conducting eluent at the time; or
- ..not completely connected; or
- ..moist on the outside so that a short circuit could occur between the connections of working eleoctrode and auxiliary electrode.

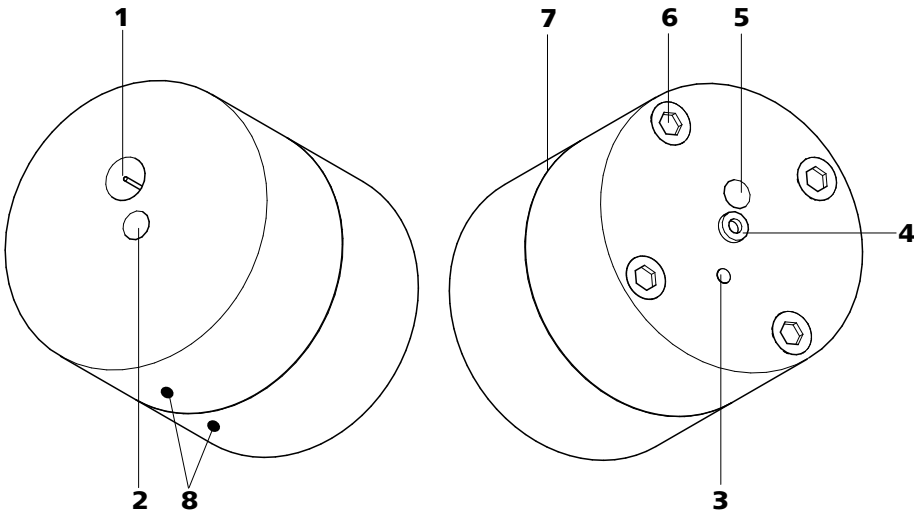

Figure 1 Parts and connections of flow cell

1 **Reference electrode connection** For black electrode cable (6.2156.000).	**2** **Inlet for eluent** Connection of PEEK capillary by 6.2744.130 KELF pressure screw only. PEEK pressure screws may damage the threads of the cell.
3 **Auxiliary electrode connection** For blue electrode cable (6.2156.000).	**4** **Working eleoctrode connection** For red electrode cable (6.2156.000).
5 **Outlet for eluent** Connection of PEEK capillary by 6.2744.130 KELF pressure screw only. PEEK pressure screws may damage the threads of the cell.	**6** **Mounting screws (4x)**
7 **Distance piece 50 µm (6.1254.020)** Defines the volume of the cell.	**8** **Check marks** For correct alignment of the top and bottom part of the flow-through cell.

Connect flow cell

1 Check mounting screws

CAUTION

Avoid overtightening the mounting screws *(1-**6**)*, as this could damage the distance piece *(1-**7**)*!

- Use the provided hexagon key (6.2621.150) to loosen all four mounting screws *(1-**6**)* by one rotation.
- Then slighly tighten the screws again, e.g. by holding the hexagon key between index finger and thumb only.
- Finally, tighten all four mounting screws by a quarter rotation. Always tighten opposing screws, i. e. tighten one screw antd then its opposite.

2 Connect the electrode cable

- Attach the electrode cable (6.2156.000 delivered with the 871 Advanced Bioscan) to the working electrode connection *(1-**4**)* (red), the reference electrode connection *(1-**1**)* (black), and the auxiliary electrode connection *(1-**3**)* (blue) of the flow cell.
- Attach the other end to the connection for electrode cable of the 871 Advanced Bioscan.

3 Connect the separating column

- Use a pressure screw (6.2744.130) to screw the column connection capillary of the separating column to the inlet for eluent *(1-**2**)*. Push the connection capillary into the inlet as far as it will go (approx. 1.5 cm) and then fix it with the pressure screw (this will prevent dead volume).

4 Connect waste tubing

- To ensure sufficient back pressure, connect a PEEK capillary (6.1831.010) of approx.1m length to the outlet for eluent *(1-**5**)*. Push the PEEK capillary into the outlet as far as it will go (approx. 0.5 cm) and then fix it with a pressure screw (6.2744.130) (this will prevent dead volume).
- Place the other end of the PEEK capillary into a waste container and attach it.

5 Mount the flow cell

- Attach the flow cell to the measuring cell holder of the Bioscan.
- Rotate flow cell in its holder so that the outlet is located as high as possible. This allows possibly occuring air bubbles to escape from the cell.

3 Technical Data

3.1 General

Construction Flow cell with working, reference and auxiliary electrode.

Cell volume The cell volume depends on the thickness of the selected distance piece:

Distance piece	Cell volume
25 µM	0.15 µL
50 µM	0.29 µL
120 µM	0.71 µL

Working temperature The flow cell should not be operated permanently at temperatures higher than 45 °C.

Reference electrode

Type Solid phase reference electrode

Conversion to Ag/AgCl $E_{Hy\text{-}REF} = E_{Ag/AgCl} - 328 + 29.9\ pH\ (mV)$

3.2 Gold flow cell

Arbeitselektrode

Material Gold

Durchmesser 3 mm

Working electrode

Material Gold

Diameter 3 mm

Applications Sugar and amino acids

- mono-, di-, oligo- and polysaccharides
- sugar alcohols
- sugar amines
- sugar acids
- amino acids
- antibiotics

Operating modes DC and PAD

Operating range

Acidic medium	-0.35 V…+1.1 V
Alkaline medium	-1.25 V…+0.75 V

3.3 Glassy Carbon flow cell

Working electrode

Material	Glassy-Carbon
Diameter	3 mm

Applications

Aromatics and amines
- catecholamines, aromatic amines
- inorganic anions (nitrite, sulfite ...)
- phenols
- vitamins
- few amino acids

Operating modes DC only (not PAD)

Operating range

Acidic medium	-0.8 V… +1.3 V
Alkaline medium	-1.5 V… +0.6 V

3.4 Platinum flow cell

Working electrode

Material	Platinum
Diameter	3 mm

Applications

Special applications
- alcohols
- glycols
- hydrogen peroxide
- hydrazine
- arsenite, hypochlorite

Operating modes DC and PAD

Operating range

Acidic medium	-0.2 V… +1.3 V
Alkaline medium	-0.9 V… +0.65 V

3.5 Silver flow cell

Working electrode

Material	Silver
Diameter	2 mm
Applications	Environmental applications ▪ halides ▪ cyanide, sulfide ▪ thiosulfate ▪ pharmaceuticals
Operating modes	DC and PAD

Operating range

Acidic medium	-0.55 V… +0.4 V
Alkaline medium	-1.2 V… +0.1 V

4 Accessories

Up-to-date information on the scope of delivery and optional accessories for your product can be found on the Internet. You can download this information using the article number as follows:

Downloading the accessories list

1. Enter *https://www.metrohm.com/* into your Internet browser.
2. Enter the article number (e.g. **6.5331.0X0**) into the search field.
   The search result is displayed.
3. Click on the product.
   Detailed information regarding the product is shown on various tabs.
4. On the **Included parts** tab, click on **Download the PDF**.
   The PDF file with the accessories data is created.

NOTICE

Once you have received your new product, we recommend downloading the accessories list from the Internet, printing it out and keeping it together with the manual for reference purposes.

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