

dProfitrode



6.00204.300

Sensor leaflet

8.0109.8005EN / 2020-08-31



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1.1 dProfitrode – Product description

1.2 dProfitrode – Overview



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2 Functional description

2.1 dProfitrode – Functional description

The glass membrane of the dProfitrode consists of a silicate framework containing lithium ions.

When the glass surface is immersed in an aqueous solution, then a thin hydrated layer (gel layer) forms on the outside and inside of the glass surface.

Because the proton concentration in the internal buffer of the dProfitrode is constant (pH 7), a stationary condition arises on the internal side of the glass membrane. If the proton concentration in the measuring solution changes, an ion exchange takes place in the outer hydrated layer, thus leading to a change of potential on the glass membrane.

Only when this ion exchange has reached a stationary condition, the potential of the dProfitrode is also constant.

3 Transport and storage

3.1 Electrode – Checking the delivery

Immediately upon arrival of the merchandise, check the shipment to ensure absence of damage.

3.2 Electrode – Storing the packaging

The product is supplied in extremely protective special packaging. Keep this packaging, as only this ensures safe transportation of the product.

3.3 Unpacking and inspecting the electrode

1 Unpacking the electrode

Remove the electrode with storage vessel from the packaging.

2 Removing the storage vessel

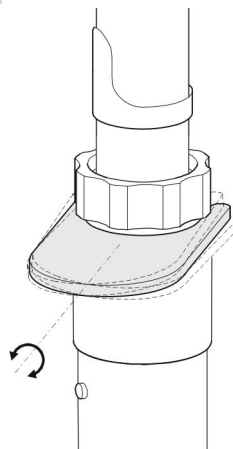


Figure 2 Releasing the electrode from the storage vessel

- Hold the electrode and storage vessel firmly in your hand so that the electrode cannot slip away.
- Position the tool between the storage vessel and SGJ sleeve.
- **Carefully** push the tool to the side to release the electrode.
Do not tip the tool forwards!



NOTICE

Avoid applying excess pressure to the tool. Otherwise, the electrode could be released too abruptly.

3 Inspecting the electrode for proper function

- **Preparing the electrode:**
Preparing the dProfitrode (see chapter 4.1, page 6)
- **Calibrating the electrode:**
Calibrating the dProfitrode (see chapter 5.1, page 9)



NOTICE

Defective electrodes must be sent back for warranty processing within two months (starting from the day of delivery).

3.4 Storing the dProfitrode



CAUTION

Property damage caused by dried out sensor

Destruction of the sensor due to drying out.

- Do not let the sensor dry out.
- Follow the storage instructions.

The electrode head must be stored as follows to protect it from water, solvents, dust and mechanical influences:

- 1 Screw the protective cap (1-1) onto the electrode head (1-2).
- 2 Store the electrode in the storage vessel. When doing so, ensure that the electrode above the flexible ground-joint diaphragm (1-5) is immersed in the storage solution.





The storage solution may only be used for this electrolyte; we recommend to store all other electrolytes in the bridge electrolyte.

- 3



NOTICE

To remove the cable, first release the outer ring and then carefully pull the cable connection from the electrode head.

When doing so, be sure not to pull on the cable itself but the cable connector instead.

4.2 Mounting the electrode



The electrode must sit securely in the titration head.



NOTICE

For automatic procedures, ensure that the cables have enough room to move.

During the titration, it is important that the solution is mixed well. The stirring rate should be high enough to form a small vortex. If the stirring rate is too high, then air bubbles will be aspirated. These may result in incorrect measured values. If the stirring rate is too low, then the solution is only mixed slowly and the reaction time or titration time increases accordingly.

In order for the measurement to be taken in a well-mixed solution after the addition of the titrant, the titration tip should be positioned where tur-

bulence is high. Furthermore, the distance between the addition of the titrant and the electrode should be as large as possible. Therefore, take into account the stirring direction (counterclockwise or clockwise) when positioning the electrode and titration tip.

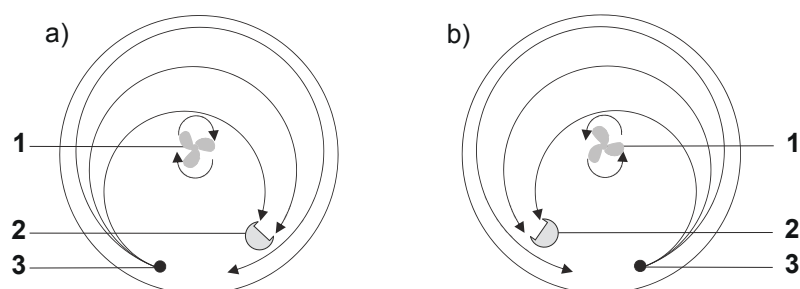


Figure 3 Diagrams showing rod stirrer, electrode and titration tip during a titration. a) clockwise stirring direction, b) counterclockwise stirring direction.

1	Rod stirrer	2	Electrode
3	Titration tip		

5 Operation and control

5.1 Calibrating the dProfitrode

- 1** Rinse the electrode with distilled water.
- 2 Calibrating the electrode with the first buffer**
Immerse the electrode in buffer solution (pH 7) and start the calibration.
- 3** After a successful measurement, remove the electrode from the buffer and rinse it with distilled water.
- 4 Calibrating the electrode with the second buffer**
Repeat steps 2 and 3 with the second buffer.
- 5 Calibrating the electrode with the third buffer, if necessary**
Repeat steps 2 and 3 with the third buffer.
- 6** Use the following information to determine if the electrode meets the requirements:
 - **Slope:**
95 %...103 %
 - **pH:**
6.5...7.5
 - **Offset of potential:**
-30 - 30 mV

6 Maintenance

6.1 dProfitrode – Changing/refilling the electrolyte

- 1 Open the filler openings (1-**3**) and (1-**4**).
- 2 Push down the flexible ground-joint diaphragm (1-**5**) and let the bridge electrolyte drain. Afterwards, push the ground-joint diaphragm up again.
- 3 Rinse the bridge electrolyte chamber with the new electrolyte.
- 4 Fill the electrode with electrolyte up to the filler openings.
- 5 Close the filler openings (1-**3**) and (1-**4**) if the electrode is not used immediately.
- 6 Immerse the electrode in a storage solution overnight.
Then, the electrode is ready for use again.

6.2 Cleaning the dProfitrode

- 1 Rinse the electrode with distilled water.



NOTICE

Do not treat the electrode in ultrasonic baths! The electrode could become damaged.

7 Troubleshooting

Problem	Cause	Remedy
Slope too low	<i>Solid deposits on membrane surface</i>	Clean the electrode with a solvent/strong acid.
	<i>Deposition of proteins on membrane surface</i>	Clean the electrode with 5% pepsin in 0.1 mol/L of HCl.
	<i>Reference system contaminated or dried out</i>	Clean the reference system with a reference electrolyte and refill it. Then, store the electrode in storage solution.
	<i>Ground-joint diaphragm contaminated</i>	Clean the electrode with pHit kit (6.2325.000).
Slow response	<i>Electrostatic charge</i>	Do not dab the glass membrane with a towel.
	<i>Solid deposits on membrane surface</i>	Clean the electrode with a solvent/strong acid.
	<i>Deposition of proteins on membrane surface</i>	Clean the electrode with 5% pepsin in 0.1 mol/L of HCl.
Zero point shift	<i>The electrode was in dry storage</i>	Store the electrode in a storage solution overnight.
	<i>Solid deposits on membrane surface</i>	Clean the electrode with a solvent/strong acid.
	<i>Deposition of proteins on membrane surface</i>	Clean the electrode with 5% pepsin in 0.1 mol/L of HCl.
	<i>Reference system contaminated or dried out</i>	Clean the reference system with a reference electrolyte and refill it. Then, store the electrode in storage solution.
	<i>Ground-joint diaphragm contaminated</i>	Clean the electrode with pHit kit (6.2325.000).



8 Technical specifications

8.1 Ambient conditions

Nominal function range	+5 to +45 °C	at max. 80% relative humidity, non- condensing
Storage	+5 to +45 °C	

8.2 dProfitrode – Dimensions

Measurements

<i>Shaft diameter</i>	12 mm
<i>Maximum installation length</i>	125 mm

8.3 dProfitrode – Housing

Materials

<i>Shaft material</i>	Glass
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8.4 dProfitrode – Connectors specifications

Connector	Metrohm plug-in head Q
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Status display	LED	green - red
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pH range 0 - 14

Short term 0 - 100 °C

Long term 0 - 80 °C

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