

1 Electrode holder and SPE

Scope of application

The electrode shaft has been developed for screen-printed electrodes (SPE) with the dimensions

- (W/H/D) 10/34/0.5 mm
- 3 electrode connections with a distance of 2 mm from each other

The electrode shaft can be used with

- Measuring head 6.1256.030 (for 884 Professional VA)
- Measuring head insert 6.1412.020 (for 663 VA Stand and 797 VA Computrace)

Assembling the SPE holder

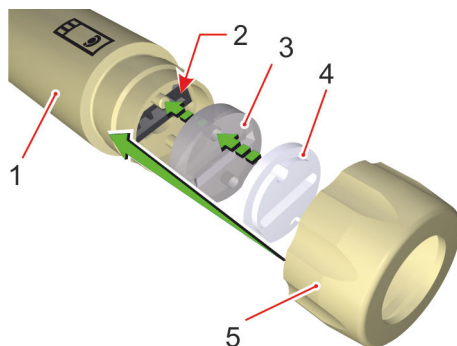


CAUTION

Before assembling the electrode holder, make sure that all parts are completely dry. Check especially

- the connection socket for the SPE (2)
- the slot in the silicone seal (3)

for solution. Liquid entering the connection socket for the SPE (2) can damage the electrode holder.



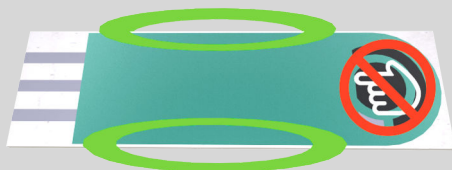
1. Place the silicone seal (3) in the shaft (1). Two pins support the positioning and prevent the seal from turning out of position.
2. Place the supporting ring (4) on top of the silicone seal with the planar side pointing towards the seal. The two pins support the positioning. The slot in the supporting ring has to be congruent with the slot in the silicone seal.
3. Place the nut (5) on the shaft. Do not tighten the nut, otherwise the SPE cannot be assembled with the holder.

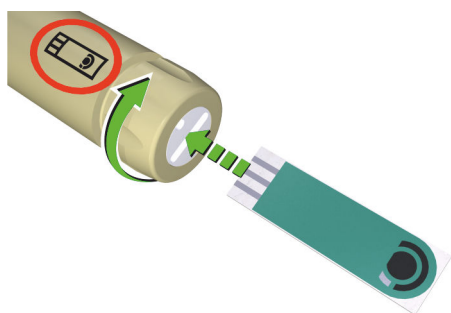
Assembling the SPE



CAUTION

Always hold screen-printed electrodes at the edges, in order not to touch the active electrode surface.





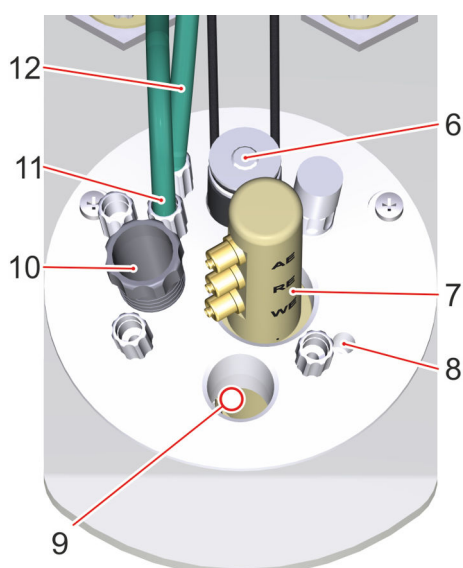
1. Align the screen printed electrode with the symbol on the shaft of the electrode holder. The symbol and the electrode surface have to point in the same direction.
2. Slide the SPE straight into the slot of the silicone seal until the stop.
3. Tighten the nut in a clockwise direction to fix the electrode and seal the inside of the holder against liquids.



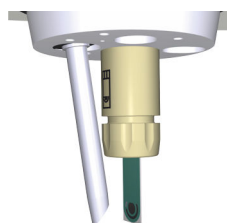
CAUTION

Tilting the electrode may damage the connection socket for the SPE behind the silicone seal.

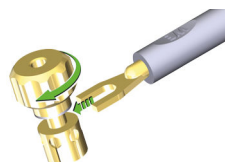
663 VA Stand and 797 VA Computrace - Equipping measuring head insert 6.1412.020



1. Replace the standard measuring head insert in the 797 VA Computrace or 663 VA Stand with the SPE measuring head insert (6.1412.020).
2. Insert the stirrer in position **6**.
3. For purging the measuring solution, the tubing 6.1819.000 and 6.1805.180 have to be installed in position **8**. In this case, make sure that the FEP tubings in position **11** (nitrogen supply for tapping mechanism) and **12** (gas outlet) are also connected.
4. Connect the FEP tubings for inert gas supply of the MME with the connection bushing (6.1808.000).
5. Insert the electrode shaft with the assembled SPE in position **7** of the measuring head.
6. Position the holder in a way that the SPE surface faces the stirrer.

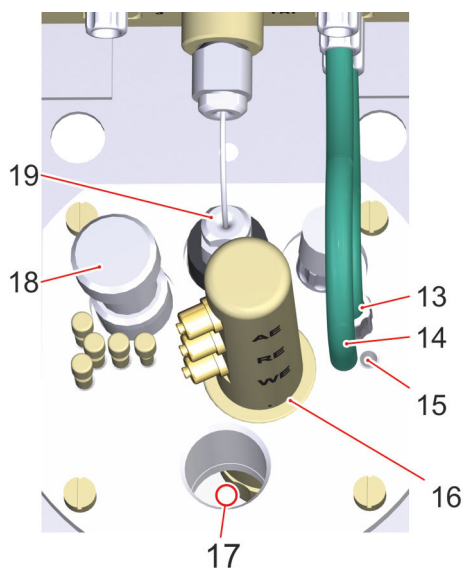


7. Connect one adapter (6.2112.130) each to the electrode cables.

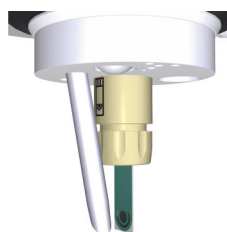


8. Connect the electrode cables to the respective connectors on the electrode head (cable AE → connector AE, cable RE → connector RE and cable WE → connector WE)
9. Spare M6 connections are closed with threaded stoppers (6.1446.040). The spare opening **10** is closed with a SGJ stopper (6.1446.000).
10. The pipetting opening in position **9** is closed with the stopper for pipetting opening (6.2709.080).

884 Professional VA - Equipping measuring head 6.1256.030



1. Insert the stirrer in position **19**.
2. For purging the measuring solution, the tubing 6.1829.030 has to be installed in position **15**. In this case, make sure that the FEP tubing in position **13** is also connected to the M6 threaded opening **TAP** on the measuring head connector plate and the tubing in position **14** to the M6 tread opening **OUT**.
3. Make sure that the two M6 threaded openings **N₂** on the measuring head connector plate are closed with threaded stoppers (6.1446.040).
4. Insert the electrode shaft with the assembled SPE in position **16** of the measuring head.
5. Position the holder in a way that the SPE surface faces the stirrer.



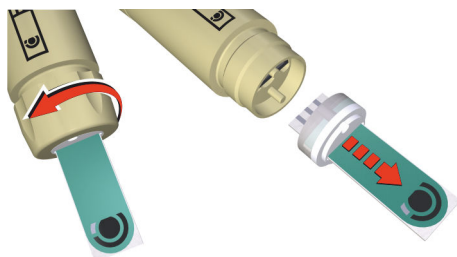
6. Connect the electrode cables to the respective connectors on the electrode head (cable AE → connector AE, cable RE → connector RE and cable WE → connector WE)
7. The spare opening in position **18** as well as spare openings for tubing connections are closed with suitable stoppers from the stopper set (6.2709.110).
8. The pipetting opening **17** is closed with the stopper (6.2709.100) when the measuring head cover is attached.

Disassembling the SPE



NOTICE

Screen-printed electrodes can only be used for a limited number of measurements and have to be replaced in regular intervals. The lifetime and the frequency of replacement depend on the type of electrode and the application. Details can be found in the respective application documentation.



1. Pull the complete electrode holder out of the measuring head.
2. Unfasten the nut (**5**) in a counterclockwise direction and remove it from the electrode holder.
3. Pull out the SPE together with the silicone seal (**3**) and the supporting ring (**4**).
4. Separate the SPE from the silicone seal and the supporting ring.
 - a. Discard the SPE.
 - b. The silicone seal and the supporting ring can be reused.
5. Thoroughly dry all parts of the electrode holder.



NOTICE

The nut can be slippery when wet. In this case dry the electrode holder with a tissue before unfastening the nut.

2 Troubleshooting

The SPE cannot be inserted into the holder

- The nut is already too tight and seals the slot in the silicone seal.
 - Unfasten the nut to release pressure from the silicone seal which opens the slot for the SPE.
- The supporting ring turned out of position.
 - Unfasten the nut and turn the supporting ring so that the slot in the supporting ring is congruent with the slot in the silicone seal. Also make sure that the planar side of the supporting ring is attached to the silicone seal.

The sensor shows no measuring signal even though analyte is present.

- The electrode is mounted in reverse position.
 - Make sure that the electrode surface and the symbol on the holder point in the same direction. Only in this position the electrode has electrical contact in the connection socket.
- The SPE is not plugged into the connection socket.
 - Unfasten the nut and push the electrode in until the stop.
- The SPE is defective
 - Try a different SPE.

The curves show an unusual shape.

- Electrode cables are interchanged.
 - Make sure that all electrode cables are connected to the correct connector.
- The electrode surface was touched during assembly of the SPE.
 - Always hold the SPE at the edges in order to avoid contact with the electrode surface.
- Solution penetrated the SPE holder and short-circuits the electrodes in the connection socket.
 - Disassemble the electrode holder. To remove corrosive chemicals, rinse everything with ultrapure water. Then thoroughly dry all parts. If the electrode connection socket is rinsed too, the holder has to dry for a couple of hours before reassembling to ensure that no moisture is captured in the holder.

Liquid is found close to the connection socket for the SPE



CAUTION

Repeated entry of measuring solution will corrode the electrode contacts in the connection socket for the SPE (2). This part of the SPE holder cannot be replaced. In case of corroded contacts, the complete electrode holder has to be replaced.

- The nut (5) is not tightened enough.
 - Fasten the nut until the slot in the silicone seal completely seals the SPE.
- The silicone seal (3) is defective.
 - The silicone seal is a consumable. The sharp-edged SPEs can cut into the silicone. It is recommended to replace the silicone seal every 25 electrodes.
- The supporting ring (4) is bent.
 - The supporting ring deforms over time. Replace the supporting ring when it is deformed and therefore does not equally distribute the pressure anymore.

Replacement parts

- 6.1241.200 Nut for SPE electrode shaft
- 6.1241.210 Supporting ring for SPE electrode shaft
- 6.1244.060 Silicone seal for SPE electrode shaft (10 pieces)