

- Lay a piece of special emery paper on a paper wipe.
- Hold the sensor upright.
- Hold the special emery paper in place and move the tip of the working electrode over it at least twice. Use a fresh area of the emery paper for each pass.

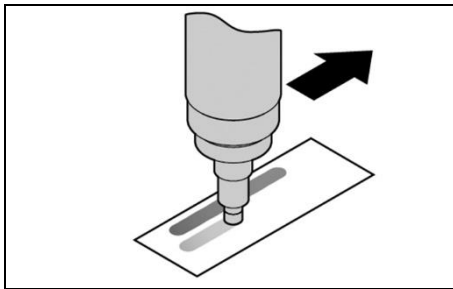



Abb. 11: Using emery paper to clean the working electrode

- Return the hose ring to its original position.
- ↪ The valve opening is now covered.

	<p>Please note</p> <p>When changing the membrane cap: Use a new membrane cap.</p>
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- Perform the same operations as for commissioning (see section 5, page 18).

- ↪ Maintenance has now been completed and the sensor can be put back into use.

9. Troubleshooting

Various factors in the environment can affect the sensor.

If irregularities occur, it may be useful to check these factors:

- Flow rate
- Measuring cable
- Measuring and control device
- Calibration
- Dosing equipment
- Concentration of the disinfectant in the dosing container
- Suitability of the sensor for measuring the disinfectant that is being
 - dosed
- Concentration of the disinfectant in the measuring water (determined
 - by analytical methods)
- pH value of the measuring water
- Temperature of the measuring water
- Pressure in the flow chamber
- Analytical methods

9.1 Fault overview

Fault	Cause	Corrective action
Sensor cannot be calibrated / deviation of the measuring value from DPD measurement	Run-in time too short.	<ul style="list-style-type: none"> ▶ Wait for the run-in period (one hour). ▶ Repeat the calibration after a few hours.
	Membrane torn.	▶ Change the membrane cap (see section 8.2, page. 28).
	Membrane cap damaged.	▶ Change the membrane cap (see section 8.2, page. 28).
	Disruptive substances in the water contents.	<ul style="list-style-type: none"> ▶ Check the water for disruptive substances and remedies (observe data sheet, 2.8 page 12). ▶ Consult the supplier.
	Short circuit / defect in the measuring lead.	<ul style="list-style-type: none"> ▶ Locate and eliminate the short circuit / defect. ▶ Exchange the measuring lead.
	Distance between working electrode and membrane is too great.	▶ Screw the membrane cap on fully to the stop.
	The DPD chemicals are past their effectiveness date.	<ul style="list-style-type: none"> ▶ Use new DPD chemicals. ▶ Repeat the calibration (see section 6, page. 25).
	Deposits on the membrane	▶ Change the membrane cap (see section 8.2, page 28).

Fault	Cause	Corrective action
	Gas bubbles on the outside of the membrane.	<ul style="list-style-type: none"> ▶ Temporarily increase the flow rate. ▶ Check the installation and modify it.
	No electrolyte in the membrane cap.	<ul style="list-style-type: none"> ▶ Fill the membrane cap with electrolyte. ▶ Prepare the sensor (see section 5.2, page 19).
	The concentration of disinfectant exceeds the upper limit of the measuring range.	<ul style="list-style-type: none"> ▶ Check the system. ▶ Remedy the faults. ▶ Repeat the calibration (see section 6.2, page. 26).
	Lack of galvanic Isolation.	<ul style="list-style-type: none"> ▶ Create galvanic isolation. ▶ Return the sensor to the supplier for checking / reconditioning.
	The sensor is defective.	<ul style="list-style-type: none"> ▶ Return the sensor to the supplier for checking / reconditioning..
Unstable measuring valu	Membrane torn.	<ul style="list-style-type: none"> ▶ Change the membrane cap (see section 8.2, page 28).
	Gas bubbles on the outside of the membrane	<ul style="list-style-type: none"> ▶ Temporarily increase the flow rate. ▶ Check the installation and modify it.
	Pressure fluctuations in the measuring water.	<ul style="list-style-type: none"> ▶ Check the type of installation and modify it.

Fault	Cause	Corrective action
	Lack of galvanic isolation.	<ul style="list-style-type: none"> ▶ Create galvanic isolation. ▶ Return the sensor to the supplier for checking / reconditioning.
	The reference electrode is exhausted and/or contaminated ¹ .	<ul style="list-style-type: none"> ▶ Return the sensor to the supplier for checking / reconditioning.
Overdriving ²	Excessive concentration of disinfectant in the measuring water	<ul style="list-style-type: none"> ▶ Check the system. ▶ Remedy the faults. ▶ Calibrate the sensor (see section 6, page 25). ▶ Perform maintenanc on the sensor (see section 8, page 27).
	Run-in time too short.	<ul style="list-style-type: none"> ▶ Wait for the run-in period (one hour). ▶ Repeat the calibration after a few hours.
	The membrane is damaged.	<ul style="list-style-type: none"> ▶ Change the membrane cap (see section 8.2, page 28).
	Flow rate too high.	<ul style="list-style-type: none"> ▶ Check the system. ▶ Reduce the flow rate.
	Lack of galvanic Isolation.	<ul style="list-style-type: none"> ▶ Create galvanic isolation. ▶ Return the sensor to the supplier for checking / reconditioning.

¹The reference electrode has a silvery sheen or is white. The usual colour on the other hand is brown/grey.

²See Table 9, page 34).

Fault	Cause	Corrective action
	The sensor is defective.	► Return the sensor to the supplier for checking / reconditioning.
Underdriving ³	Run-in time too short.	► Wait for the run-in period (one hour).
	The working electrode is contaminated.	► Perform maintenance on the sensor (see section 8, p. 27).
	Lack of galvanic Isolation.	► Create galvanic isolation. ► Return the sensor to the supplier for checking / reconditioning.
	The sensor is defective.	► Return the sensor to the supplier for checking / reconditioning.
Green LED flickering or failing to light up ⁴	Defective power supply.	► Provide the correct power supply.
	The sensor is defective.	► Return the sensor to the supplier for checking / reconditioning.
No signal	The sensor is connected to the measuring and control device with the wrong polarity ⁵ .	► Connect the sensor correctly to the measuring and control device.
	The measuring lead is Broken.	► Exchange the measuring lead.

³See Table 9, page 34

⁴Only for sensors with digital electronics.

⁵Only for sensors with 4...20-mA signal output

Fault	Cause	Corrective action
	The sensor is not receiving any power supply.	► Provide the correct power supply.
	The sensor is defective.	► Return the sensor to the supplier fo checking / reconditioning.

Table 8: Faults overview

9.1.1 Output signal of the sensor in case of under-/overdrive

Electronics	Signal transmission	Underdriving	Overdriving
Analogue	4 ... 20 mA	<4 mA	>20 mA
	0 ... +2000 mV	<0 mV	>+2000 mV
	0 ... -2000 mV	>0 mV	<-2000 mV
Digital	Modbus RTU	<0 ppm/ % <0 nA	Measured value > Measurement range
	0 ... +2000 mV	Orange LED lights up ⁶	<ul style="list-style-type: none"> • >+2000 mV • Orange LED flashes regularly
	0 ... -2000 mV	Orange LED lights up ⁷	<ul style="list-style-type: none"> • <-2000 mV • Orange LED flashes regularly

Table 9: Output signal of the sensor in case of under-/overdrive

⁶The displayed output signal must be multiplied by a factor of -1.

⁷The displayed output signal must be multiplied by a factor of -1.

9.2 Special checks

9.2.1 Tightness of the membrane cap

- ▶ Unscrew the membrane cap from the sensor (see section 8.2, page 28).
- ▶ Dry the outside of the membrane cap.
- ▶ Prepare the membrane cap 5.2, page 19).
- ▶ When screwing the membrane cap on, watch out for liquid escaping through the membrane.

If liquid does escape through the membrane:

- ▶ Use a new membrane cap.

If the sensor does not respond:

- ▶ Return the sensor to the supplier for checking.

9.2.2 Electronics

- ▶ Unscrew the membrane cap.
- ▶ Rinse the electrode finger with mains water.
- ▶ Using a clean cloth, carefully dry the electrode finger.
- ▶ Connect the sensor to the measuring and control device.

- ▶ Connect a suitable measuring device to the original sensor signal.
- ▶ Wait five minutes.
- ▶ Read the original sensor signal at the measuring device.
- ▶ Mark up the values that were read against the following target values:

- Sensor (mV): ca. +/- 0 mV
- Sensor (mA): ca. 4 mA
- Sensor (Modbus): approx 0 ppm or 0 %

If the sensor signal corresponds roughly with the above value, the electronics can provisionally be regarded as OK.

If the measured value deviates significantly from the above value:

- ▶ Return the sensor to the supplier for checking.

9.2.3 Checking the zero point

- ✓ The electronics must have been tested and found to be OK.
- ▶ Prepare the sensor (see section 5.2 page 19).
- ▶ Connect the sensor to the measuring and control device.

- ▶ Fill a glass beaker with mains water (without any disinfectant!).
- ▶ Stir the sensor round in the glass beaker for 30 seconds.
- ▶ Carefully put the sensor down obliquely in the glass beaker.
- ▶ Wait 30 minutes.
- ▶ Read the measuring value..

If the measuring value is close to the value 0, the zero point can provisionally be regarded as OK.

If the measuring value deviates significantly from zero:

- ▶ Perform maintenance on the sensor (see section 8, page 27) and repeat the zero point test.



Please note

A freshly cleaned working electrode has a relatively high zero point.
The sensor takes a few days to settle back to its lowest zero point..

If after maintenance has been performed on the sensor measuring value is not close to zero:

- ▶ Return the sensor to the supplier for checking.
- ↪ This completes the zero point checking.

9.2.4 Signal

- ↪ The zero point checking must have been performed successfully..
- ▶ Add the relevant disinfectant to the mains water in the glass beaker (see section 9.2.3, page 35).
- ▶ Stir the sensor steadily round in the glass beaker for five minutes.
- ▶ Monitor the measuring value throughout this time.

If the measuring value increases, the sensor can provisionally be regarded as OK.

If the measuring value does not change:

- ▶ Perform maintenance on the sensor (see section 8, page 27) and repeat the signal test.
- ↪ This completes the signal test. The sensor can be put back into use.

If after maintenance the sensor shows no response to the disinfectant:

- ▶ Return the sensor to the supplier for checking.