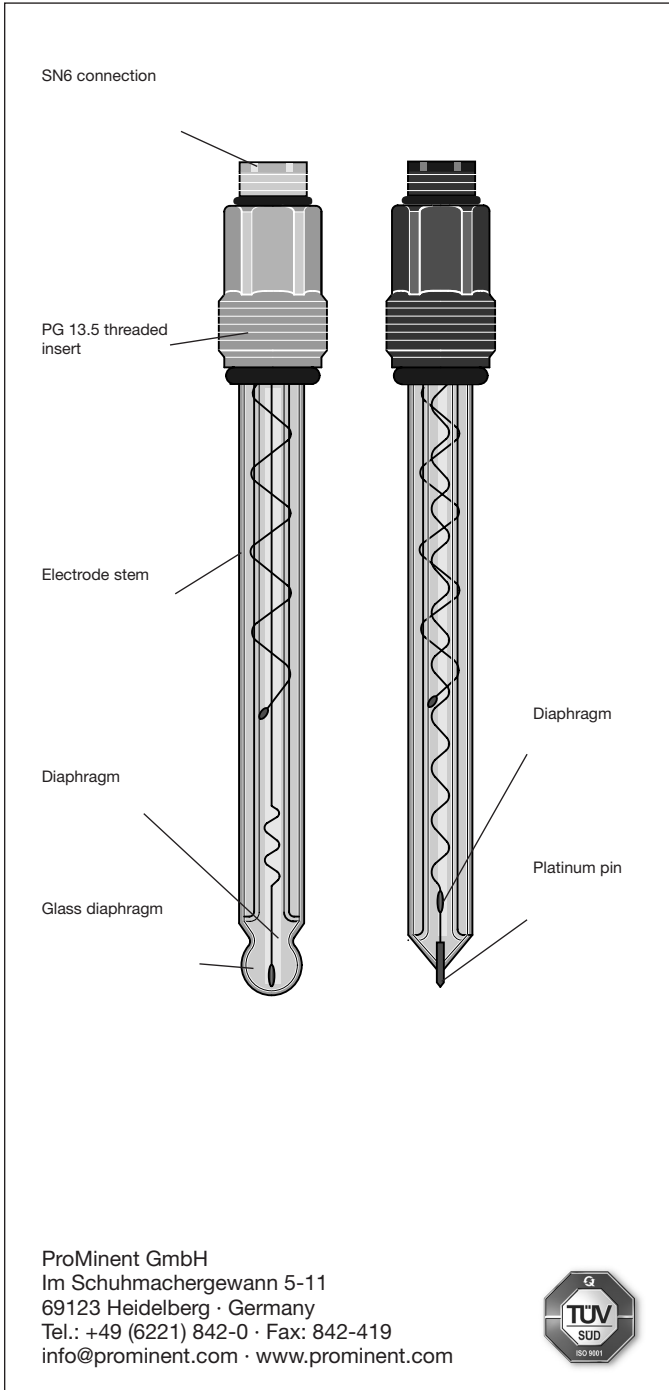


Recommendations

for handling and servicing pH and redox (ORP) combination probes

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1. General remarks

Combination probes for the measurement of pH and redox potential consist of a measuring electrode – a glass electrode for pH, a platinum or gold electrode for redox measurement – and a reference electrode, arranged concentrically around the measuring electrode.

2. Commissioning

Before putting into operation, the protective cap or case must be removed from the glass or metal electrode. The glass or metal electrode must be free from oil, grease and other contaminations. Likewise, the diaphragm of the reference electrode must be free from scale deposits, dirt or crystallized matter. For these reasons, electrodes should never be touched by hand. If contaminations are present refer to Chap. 4. "Cleaning and servicing".

3. Calibrating and checking probes

3.1 Calibrating pH probes

Zero calibration: since pH probes are subject to certain manufacturing tolerances, they must be tuned to the pertinent pH transmitter. The adjustment intervals depend on relevant operating conditions. They can vary from a few days to up to 8 weeks.

Having connected the probe to the transmitter by means of the probe cable (taking care that connectors and cable remain absolutely dry), dip the probe into a pH 7 standardizing solution and adjust transmitter exactly to read this value.

Remove the probe, rinse it with water, preferably distilled water, and dry it by swabbing it with soft, non-fluffing tissue paper.



CAUTION

Do not rub since this might cause static electricity and false readings.

Immerse the probe in a buffer solution differing by at least 2 pH from pH 7 and calibrate after the value on the display has stabilised. If within 30 seconds a steady-state value is not produced or calibration has proved impossible, clean probe as described in Section 4 and repeat calibration. If again unsuccessful, replace probe with a new one.

3.2. Checking redox probes

Having connected the probe to the transmitter by means of the probe cable (taking care that connectors and cable remain absolutely dry), dip the probe into a redox standardizing solution, e.g. of 465 mV.

The reading should reach or exceed this value within not more than 30 seconds. If the reading rises rather sluggishly or falls short more than 20 mV, clean the probe as described in Section 4 and repeat check. If again unsuccessful, replace the probe with a new one.



CAUTION

A calibration of the transmitter will not be required. This procedure serves as a probe check only.

4. Cleaning and servicing probes

All probes should regularly (once a month) undergo a visual check and be cleaned if necessary.

If deposits on the glass electrode withstand cleaning with a soft, moistened cloth, the following cleaning agents may be used:

Kind of deposit	Agent and duration of application
General deposits	Non-abrasive household cleaner
Scale or metal hydroxides	Diluted hydrochloric acid (approx. 0.1-3 %, 1-5 minutes)
Oil, grease	Solvents, like alcohol or acetone
Biofouling	Mixture of diluted hydrochloric acid and pepsin, several hours Solvents (e.g. acetone) must not be used to clean electrodes as they can damage the plastic stems.

It is essential that the probes are rinsed thoroughly after having been cleaned.

In addition, the metal surfaces of redox probes may be cleaned by sanding and polishing.

If the laterally arranged ceramic diaphragm of the reference electrode is blocked, it may be cleaned like the glass electrode. In addition it may be cleaned by cautious scraping with a finger nail, a razor blade or a fine file, but care must be taken that the diaphragm is not scratched.

5. Storage

The pH and redox combination probes may only be stored wet. For this purpose, pour a little 3-molar KCl solution into the protective cap or case and slide or screw on to the sensor.



CAUTION

- pH and redox electrodes have a limited shelf life, which is why we do not recommend storing them for more than three months.**
- Do not use distilled water for soaking since this will lead to premature ageing and damage to the reference system.**

Ensure by a visual check that the probes are free from entrapped air bubbles. If air bubbles are present, remove them by vigorously shaking the probe downward (like a fever thermometer).

Probes with KCl filling solution or gel should only be installed in open-ended in-line probe housings (max. 0.5 bar), type DLG III, or immersion-type probe housings, type ETS. Pressurized systems require special probes with a plastic electrolyte.

6. Service life

Probes are subject to natural ageing even if handled correctly. Depending on the application, a service life of between 6 months and maximum 3 years may be expected.

In individual cases, particularly when extreme service conditions are involved, their lifetime may be reduced to a matter of days.

Subject to technical alterations.