



## pH/ORP sensors

### Shipment and storage

- Each sensor has passed a routine test and is delivered in an individual packaging.
- The sensors should be stored in dry rooms at 10 to 30 °C (50 to 86 °F).
- At temperatures below -5 °C (23 °F), the sensors may burst due to freezing of the inner buffer and inner electrolyte.
- The sensors are equipped with a protection/wetting cap. This cap contains a KCl liquid that will prevent drying-out of the sensor's wet measurement end.
- Save the cap for future storage needs.
- If the protection cap is no longer available for storing, the sensor's measurement end must be stored in a KCl solution (e.g. 3 mol/l) or buffer solution (pH 4 or 7).
- If the sensor dries out in the process or during storage, soak the sensor in a KCl solution at 20 °C for 24 hours or 60 °C for 6 hours. There is a chance the sensor may not be recoverable.



Caution!

Do not store the sensors in de-ionized water.

### Calibration and measurement

- For calibration and measurement, the protection cap must be removed.
- Rinse the sensor in distilled water and it is ready for use.
- Calibration and check intervals of the sensors depend on the operating conditions (soiling, chemical load).
- For pH sensors, a two-point calibration is recommended. For ORP sensors, a one-point calibration is required. Observe the calibration instructions of the measuring instrument manufacturer.
- Automatic temperature compensation compensates for the change in the pH sensor's slope due to temperature in accordance with the Nernst factor. It does not compensate for changes in the actual pH of the sample that might occur with a change in temperature.

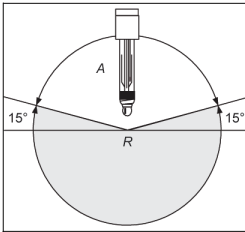
### Special ORP instructions

Unlike pH sensors, ORP sensors require equilibration time after exposure to chemicals. Chemicals found in the cleaning and calibration solutions affect the ORP potential on the metal surface that could result in an initial offset.

- Only use one value/type of buffer solution for calibration/verification as mixing two different value/type solutions could cause a reaction (i.e. blue pigment) and block/coat the junction.
- After any chemical exposure it will be necessary to leave the sensor in process fluid to equilibrate for anything from 6 to 12 hours before having reliable on-line readings.

## Sensor installation

- The inclination angle must be at least 15° from the horizontal. Some industrial sensor designs are suitable for any angle orientation, yet this is a standard recommendation



A Permitted inclination angle  
R Restricted

## Cleaning

Sensor cleaning is required before each calibration. The following agents are recommended:

Soiling	Cleaning Method
Grease and oil	(Alkaline) agents containing surfactants or water-soluble organic solvents (e.g. alcohol)
Limestone deposits, cyanide deposits, heavy biological and metal hydroxide coatings	Hydrochloric acid approx. 3 % (be aware of toxic gas evaporation e.g. hydrogen cyanide)
Sulfide deposits	Mixture of hydrochloric acid (3 %) and thiourea (saturated)
Protein coatings	Mixture of hydrochloric acid (0.4 %) and pepsin (10 g/l) freshly prepared
Fibers, suspended substances	Pressure water, possibly containing wetting agents
Light biological coatings	Pressure water
	<b>Regeneration solution</b>
Inactive pH/ORP sensors	Mixture of nitric acid (10 %) and ammonium fluoride (50 g/l) containing hydrofluoric acid



Warning!

- Observe the safety regulations for handling of chemicals and cleaning/regeneration solutions
- After cleaning, rinse all parts with de-ionized water.
- Never allow the membrane and junction to dry out!
- A short 10-15 minute period in air is unavoidable from time to time but it must be kept to a minimum.