

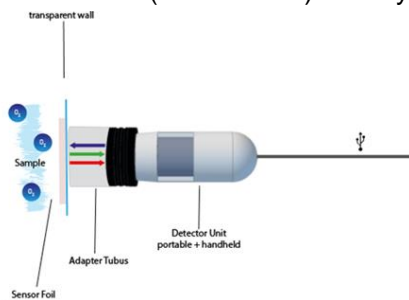
# Getting Started with VisiSens™ -

## Notes on O<sub>2</sub>, pH & CO<sub>2</sub> in Sediments

1. Please avoid any contact of the sensitive sensor foil layer with the glue or oily substances like hand cream. The sensor foil side that should be glued to a surface is marked with a colored tag (that can be removed).
2. Use the silicone glue **SG-1** for attaching O<sub>2</sub> and / or pH sensor foils. For attaching the CO<sub>2</sub> sensor foils please apply the two-component adhesive **KwikSil** (see also the respective colored tags on the foil and the glue).

In case you want to mount CO<sub>2</sub> sensor foils together with O<sub>2</sub> and / or pH sensor foils in the same vessel, please **only use KwikSil** for all sensor foils!

3. It is recommended to place the VisiSens detector unit as close to the sample as possible. The detector unit is delivered with an adapter tube that defines a certain distance to the sample and field of view (12 x 10 mm) when you place the detector directly on the sensor foil.



4. Depending on your sample, you can increase the distance between detector unit and sample up to 12 cm for a larger field of view (with our different adapter tubes: <https://www.presens.de/products/detail/visisenstm-adapter-tubes.html>). Please ensure parallel positioning and exclusion of ambient light.
5. The calibration is ideally performed in the experiment set-up. At least, the calibration set-up should be as similar as possible to the final measurement set-up (identical temperature, ambient light conditions, camera settings, distance to the sample, ionic strength of buffer / medium, ...).
6. A two point calibration is required for the quantitative image analysis of O<sub>2</sub> sensor foils. Please follow the links for a video tutorial and a description on how to prepare the calibration solutions: <https://www.presens.de/support-services/videos/video/visisens-analytical-1-calibration-936.html> <https://www.presens.de/support-services/faqs/question/how-can-i-prepare-the-calibration-solutions-cal0-and-cal100-for-oxygen-sensors-35.html>
7. The sensor foils for pH imaging require at least a 6-point calibration. We offer the CaliPlate as an accessory to ease pH sensor foil calibration (<https://www.presens.de/products/detail/caliplate-for-sf-hp5r.html> or <https://www.presens.de/products/detail/caliplate-for-sf-lv1r.html>).  
The sensor foil type HP5R has an optimal measurement range of 5.5 to 7.5 pH. Please use calibration solutions in range of 5.0 to 8.0 pH, and adjust the ionic strength of the solutions to the ionic strength of your measurement medium.

Buffer recipe for PBS buffer (usually used for calibration of **SF-HP5R**):

Preparation of 1 L Stock Solution					
	buffer capacity	total ionic strength	NaH <sub>2</sub> PO <sub>4</sub> * 1 H <sub>2</sub> O	Na <sub>2</sub> HPO <sub>4</sub> * 2 H <sub>2</sub> O	NaCl
Solution A	40 mM	140 mM	5.5 g		5.8 g
Solution B	40 mM	140 mM		7.1 g	1.2 g

The sensor foil type LV1R has an optimal measurement range of 2.5 to 4.5 pH. Please use calibration solutions in range of 2.0 to 5.0 pH, and adjust the ionic strength of the solutions to the ionic strength of your measurement medium.

Buffer recipe for citrate buffer (usually used for calibration of **SF-LV1R**):

Preparation of 1 L Stock Solution					
	buffer capacity	total ionic strength	Na <sub>3</sub> C <sub>6</sub> H <sub>5</sub> O <sub>7</sub> * 2 H <sub>2</sub> O	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>	NaCl
Solution A	40 mM	140 mM	11.8 g		1.2 g
Solution B	40 mM	140 mM		7.7 g	8.2 g

Solution A and solution B are mixed respectively to create calibration buffers of different pH values but constant ionic strength.

8. For quantitative image analysis with CO<sub>2</sub> sensor foils at least a 4-point calibration with gas mixtures of different CO<sub>2</sub> content is required. In case you do not have a gas mixing system available, please contact our service team. We gladly recommend a supplier of compact pressurized gas cylinders.
9. PreSens pH and CO<sub>2</sub> sensor foils cannot be applied in tap or distilled water! Minimum ionic strength for the pH sensors is 50 mM, and minimum buffer capacity is 2 mM.
10. pH and CO<sub>2</sub> sensor foils are designed for measurements in the liquid phase. (Partial) drying out of the sensors will cause signal changes that might mistakenly be interpreted as sensor response.
11. For long-term measurements, we recommend to re-calibrate the foil once a week or to perform a control measurement after finishing the experiment.
12. The sensor foils should be protected from ambient light whenever possible in order to avoid drift effect caused by photobleaching.

#### USEFUL LINKS:

##### Webinar

O<sub>2</sub>, pH & CO<sub>2</sub> in Sediments, Interfaces, and Biofilms <https://www.presens.de/support-services/videos/video/visisens-webinar-o2-ph-co2-in-sediments-interfaces-and-biofilms-1048.html>

##### Related Application Notes

<https://www.presens.de/knowledge/publications/application-note/o2-co2-and-ph-dynamics-in-the-capillary-fringe-653.html>

<https://www.presens.de/knowledge/publications/application-note/diffusive-dispersive-reaction-fronts-in-groundwater-631.html>

<https://www.presens.de/knowledge/publications/application-note/exchange-of-o2-and-co2-in-the-capillary-fringe-of-a-porous-medium-632.html>

<https://www.presens.de/knowledge/publications/application-note/benthic-disturbance-recovery-dynamics-in-a-changing-coastal-ocean-626.html>

<https://www.presens.de/knowledge/publications/application-note/oxygen-dynamics-around-buried-tar-balls-in-florida-marine-sands-609.html>