IoLine pH electrodes
for the most demanding measuring tasks

Patented three-chambers system with Iodine reservoir in the iodine/ iodide reference electrode

The reference system is a very important part of the pH electrode. The standard hydrogen electrode has proven too difficult in practical use to gain more than a mere theoretical importance. The Ag/AgCl system, which is nowadays almost exclusively used, can cause measuring instabilities originating from potential variations with changing temperatures or reactions between the silver ions and the measuring solution in the area of the diaphragm.

IoLine electrodes, in contrast, have the advantage of a much lower temperature sensitivity and a metal ion free reference system. The reference system is based on the following reaction:

$I_2 + I^- + 2\ e^- \Leftrightarrow 3\ I^-$

The ORP is thereby described by the Nernstian equation:

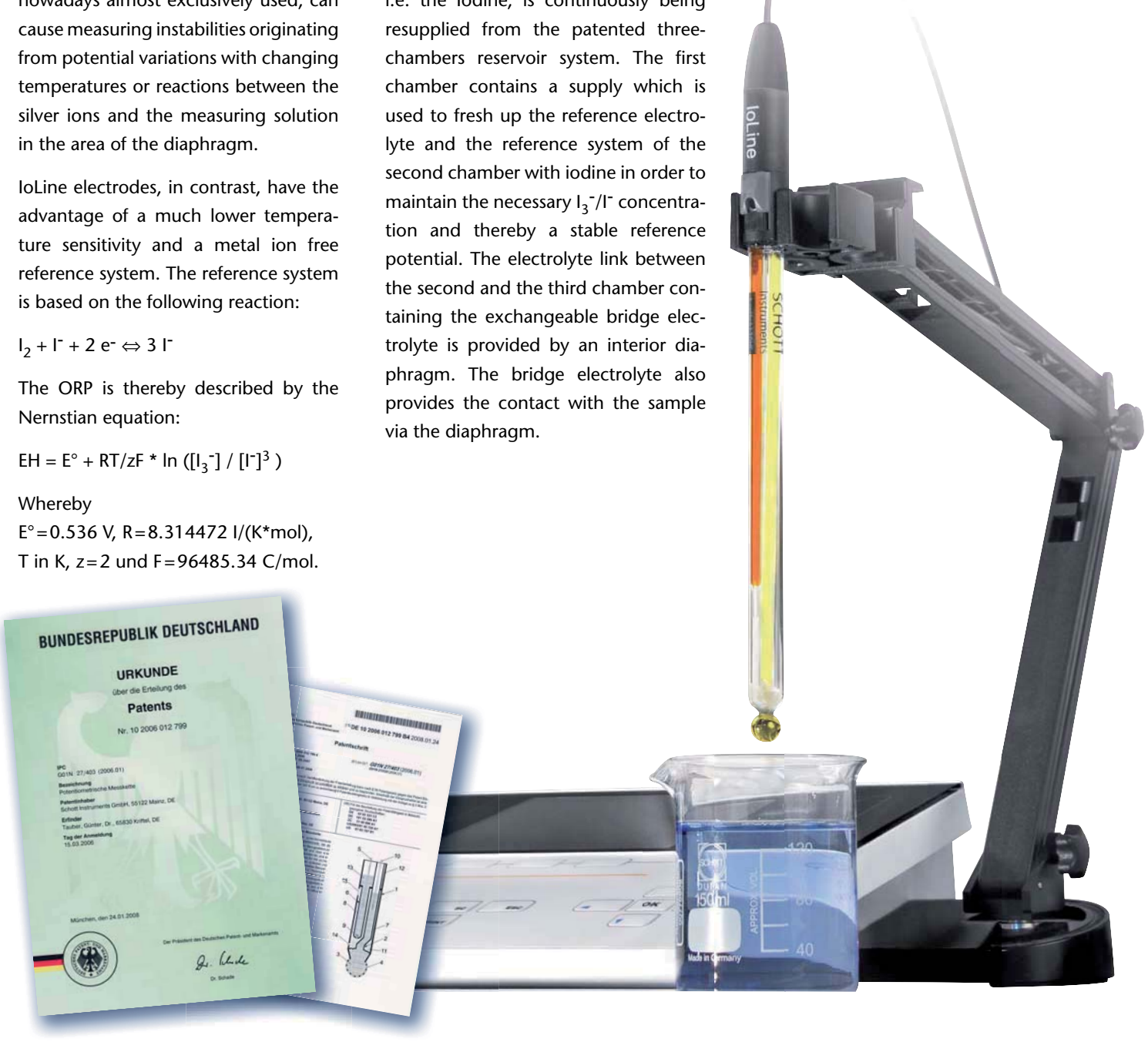
$EH = E° + RT/zF * \ln ([I_3^-] / [I^-]^3)$

Whereby
$E° = 0.536$ V, $R = 8.314472$ I/(K*mol),
T in K, $z = 2$ und $F = 96485.34$ C/mol.

The stability of the reference system potential even at changing temperatures is the key to the IoLine electrodes' superior response speed and measurement stability and, additionally, higher accuracy compared to conventional Ag/AgCl electrodes.

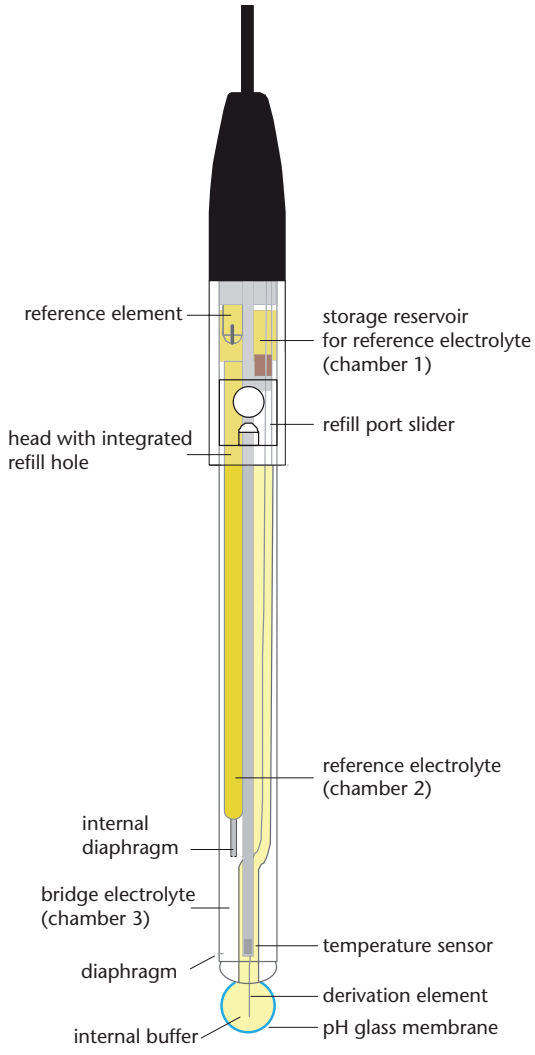
A further advantage is the fact that the component determining the potential, i.e. the Iodine, is continuously being resupplied from the patented three-chambers reservoir system. The first chamber contains a supply which is used to fresh up the reference electrolyte and the reference system of the second chamber with iodine in order to maintain the necessary I_3^-/I^- concentration and thereby a stable reference potential. The electrolyte link between the second and the third chamber containing the exchangeable bridge electrolyte is provided by an interior diaphragm. The bridge electrolyte also provides the contact with the sample via the diaphragm.

The interior diaphragm is designed to allow only a minimal diffusion of I_3^-/I^- (Tri-iodide/Iodide) into the bridge electrolyte. Hence, the iodine consumption in the reference electrolyte is very low and needs only very little re-supplying from the first chamber. The supply is practically unlimited and guarantees a high stability of the potential and a long lifespan of the IoLine electrodes.



Platinum diaphragm for fast response and high stability

Further responsible for the high stability and fast response of the iodine/iodide reference system is the platinum diaphragm, which has been developed by SCHOTT. The platinum diaphragm makes for remarkably constant and reproducible measuring characteristics of the electrode. It contains twisted platinum wires being fused into the glass shaft of the electrode. The defined spaces of the platinum wires guarantee a continuous and steady electrolyte flow and high stability of the reference system in all media and at changing temperatures.



- **Unique iodine/iodide reference system**
  in connection with the patented three-chambers reservoir system including the large iodine reservoir offering unbeatable stability, fast response times and high accuracy at a higher speed compared to the electrodes with the usual Ag/AgCl reference system. Furthermore independent from sample composition and temperature.
- **100% metal ion free reference system**
  avoids the measuring media of being contaminated by metal ions i.e. optimal for measurements in Tris buffer.
- **Exchangeable bridge electrolyte**
  enables a matching of electrolyte solution and measuring sample.
- **Wide application area**
  Ideal for most precise pH measurements in manifold media for research and quality control i.e. in pharmacy, biotechnology or food industry.
- **Electrode head with integrated refill port**
  enables an easy refilling of the reference system in connection with the refill port slider.
- **Manifold selection:**
  Many variants regarding the connection, the membrane glass types and shapes as well as diaphragms.
- **Extensive delivery scope:**
  Liquid vessel with bayonet connector to avoid drying out and for comfortable storage of the electrode and certificate are included in the delivery scope.

Advantages
IoLine