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Nexus® Solid Reference Industrial pH Sensors

The Nexus® polymer reference electrode comprises an electrolyte chamber that is entirely made of a KCl infused plastic material. The KCl is embedded within the material, as such this is no need for an additional liquid junction connection of the diaphragm. As a result, the polymer that has been saturated with KCl is in direct contact with the solution that is being measured. The Nexus® P14 series electrodes have been designed to handle very complex process applications. Most standard pH sensors are not capable of measuring pH values lower than 2, and were restricted by the temperature component of the process, the maximum temperature that could be reached was 90 degrees Celsius. In addition, as a direct result of reference poisoning sensors could not be used in mediums that included organic solvents.

These restrictions no longer apply thanks to Icon's Nexus® reference. The Nexus® P14 series pH sensor reference system is resistant to organic solvents and permits pH measurements all the way down to 0. When conducting pH measurements in the laboratory or at industrial plants, using the Nexus® P14 pH Sensor series reference system ensures both reliability and accuracy in the readings. The Nexus® P14 series Nexus® reference can be used to solve virtually every measurement challenge, including those involving media that are particularly unclean, fatty, oily, ion-weak, or protein-rich. Problems with the reference liquid junction diaphragm are no longer caused by solids in suspension. In procedures that involve hydrogen sulfide or other sulfide compounds, there is no chance of silver sulfide contamination because the KCl-saturated polymer does not contain AgCl. The ProCon® Nexus® pH sensor reference junction system should always be the first choice in challenging applications due to its high-pressure rating of 10 bar (145 PSIG), its extended temperature rating of up to 130 degrees Celsius, and its maintenance-free operation. The ProCon® P14 pH sensor electrodes that make use of the Nexus® solid reference electrolyte pH sensors are even acceptable for steam sterilization in applications that are related to biotechnology.

The diaphragm, sometimes referred to as the liquid junction due to the common name that is commonly given to this component of the reference electrode, is an extremely vital and crucial component. It acts as an electrolytic interface between the conducting system made of silver and silver chloride and the solution that is being measured. A porous ceramic plug that is fused into the glass wall at the lower end of a reference electrode is what the diaphragm will typically consist of in the majority of instances (porous ceramic diaphragm). There are many different types of diaphragms, which all differ in their manufacture and their design. Each variety has a unique set of benefits and drawbacks. In most cases, the type of measurement that will be performed will be the deciding factor in which diaphragm to choose.

Porous Ceramic Diaphragms (Economical and General Purpose pH sensors)

It is likely that the porous ceramic diaphragm is the one that is utilized the most frequently today. It is quite simple to produce, in addition to having excellent resistance to chemicals. This junction allows for a consistent flow of electrolytes, but since it has such a huge surface area, it is extremely susceptible to reference contamination.

It is of the utmost significance to select the appropriate diaphragm for a measurement application; it should be noted that this is not always a straightforward task. In many cases, the experimental "trial and error" strategy is the only one that can lead to the successful application of a particular type of diaphragm.

It is necessary to study the ProCon® technical data sheets or contact Icon directly in order to obtain specific information. While a diaphragm prevents unfettered mixing of both solutions within the reference electrode, it allows for a controlled leak of the electrolyte solution into the medium that is being measured. During pH measurements, it is common for the solution being measured to seep into the electrolyte used as a reference, which can lead to the poisoning of the conducting system used for the reference. This Nexus® solid reference feature found in the P14 series is designed to prevent the measured solution from seeping through the diaphragm of the electrode.

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