

## Full line-up

Because sensors interface directly to the process, they must be exactly matched to the chemistry of the measured medium and to the prevailing pressure and temperature conditions. These essential requirements for error-free, low-maintenance, and reliable recording of process parameters are optimally met by the new range of Knick sensors. In conjunction with suitable fittings and analyzers by Knick, top performance is achieved in a wide range of applications – even in hazardous locations.

### **pH sensors with application-specific properties**

Even today, sensors with the classical glass membrane are the most reliable and accurate pH sensors and, for this reason, they are also the standard at Knick. Since pH sensors have a temperature-specific characteristic (Nernst), the temperature must be recorded at the same time as the pH value for compensation purposes. Most pH sensors by Knick are equipped with integrated temperature detectors. The multi-pole connection required for these sensors is established using a VarioPin (VP) connector cap.

"Glass highly resistant to alkalis" has proved successful as pH-sensitive glass with universal properties for the majority of applications, particularly processes with a strong chemical influence or for CIP cleaning. For measurements at very low temperatures, a special pH glass with low impedance is used.

Special requirements have to be met by the reference electrodes due to the individual process conditions. Examples of these include chemical influences, wide pressure and temperature ranges, hygienic conditions, and sterilization capability. Different pH sensor models are available to address these varying requirements.

In media with strong impurities and high pressures, reference electrodes with open junctions and solid polymer electrolytes have proven successful. If the measured medium has very low conductivity, sensors with a pre-pressurized gel electrolyte, or a refillable liquid electrolyte that can be pressurized, are recommended in combination with ceramic junctions. These sensors also offer advantages in heavily polluted media and media that contaminate the reference system through the cleaning effect of the continuous electrolyte outflow. Sensors with large-surface PTFE ring junctions also have long service lives in these difficult media. Protection against sensor contamination is achieved by an additional, pressure-compensated electrolyte bridge.

pH sensors that do not require a glass membrane as a pH-sensitive element avoid possible glass breakages and offer advantages in foodstuff and cosmetics-producing plants. Instead of the glass membrane, these sensors have an ISFET (ion-sensitive field-effect transistor) with a pH-sensitive coating, which is embedded in a robust plastic body.

### **Conductivity sensors for the entire field of aqueous electrolytes**

The conductivity of aqueous media covers a range of more than eight decades, starting with ultra-pure water with 0.055  $\mu\text{S}/\text{cm}$  and going as far as fully dissociated acids or bases with more than 1,000  $\text{mS}/\text{cm}$ .

The applications for conductivity measurement vary from checking the purity of feed water in power plants to measuring highly concentrated electrolyte solutions.

Measuring conditions are often difficult, since the processes take place in wide pressure and temperature ranges and the measuring media may be heavily polluted.

Ideally, these requirements can only be met by sensors which are adapted to the application-specific conditions. Knick offers sensors that measure with two or four electrodes, as well as electrodeless, toroidal sensors that measure according to the inductive principle. All sensors are equipped with a temperature probe for automatic temperature compensation. Various process connections, such as threads, flanges, clamps, and unions, are available.

In media that have low conductivity levels and are neither heavily polluted nor contain coating-forming components (oil, lime etc.), highly accurate measurements can be carried out with two-electrode sensors that have a coaxial electrode geometry. Various versions of these are available.

Sensors for specific applications include a particularly robust sensor with high temperature and pressure stability for monitoring ultra-pure water (e.g. for feed water in power plants), and a sensor particularly suitable for hygienic processes on account of its electro-polished surface with very low surface roughness (

Coaxial sensors are supplemented by a low-cost sensor with fixed cable connection.

A sensor using special graphite as electrode material allows the measurement of low

to medium conductivity, at moderate pollution levels and in corrosive media. For very high pressures and temperatures, Knick offers a special sensor model which, through the selection of special materials (PTFE / platinum), is also resistant to extreme chemical and corrosive influences. With its four-electrode design, this sensor has a considerably wider measuring range than sensors with two electrodes.

Electrodeless sensors by Knick stand out on account of their especially wide measuring range. The sensors have a smooth, easy-to-clean design and are practically impervious to pollution. The measurement is not influenced even by non-conductive coatings. Since the entire sensor body in contact with the process consists of only one material, a maximum of chemical resistance is achieved through the use of high-quality, high-tech plastics such as PEEK or PFA. Lower cost sensors with similar functionality can be used for industrial water and waste water treatment applications with versions made of PP.

#### **Low-maintenance oxygen sensors**

Sensors by Knick for measuring dissolved oxygen (DO) are characterized by a high level of concern for process safety. The robust, modular design uses durable materials and is extremely reliable with low maintenance requirements. The steel-mesh-reinforced, PTFE-coated membrane can be replaced quickly and easily, as well as the complete inner body of the electrode system.

The sensors offer a high resolution of 6 ppb. With a version for trace measurement, a value of 1 ppb can be achieved.

Sensors in a hygienic, stainless steel design with an extremely smooth surface are EHEDG-certified and 3A-conforming. They can be sterilized, run through an autoclave, and are CIP-resistant. A low-priced version with a plastic body is available for simple applications. All DO sensors can be used with Knick transmitters, with 2-wire technology or field bus, in safe or hazardous locations. In certain applications, for example to check inerting agents, the sensors can also be used to measure oxygen in gases.