Zirkon® DIS

Kuntze sensors stand for quality and are manufactured by our own production. Made in Germany.

Zirkon® DIS Pool is a potentiostatic sensor using an amperometric measurement. Measurement parameter and range are selected in the analyzer software.

Advantages

> Automatic cleaning by ASR® possible
> Low maintenance due to gel filling
> Stable zeropoint
> High quality Zirkon junction for reliable measurement results

Measuring Parameter

> Free Chlorine:
up to 1000 µg/l; up to 5,00 ; 10,00 ; 20,00 mg/l
> Chlorine Dioxide:
up to 1000 µg/l; up to 5,00 ; 10,00 ; 20,00 mg/l
> Ozone:
up to 1000 µg/l; up to 5,00 ; 10,00 ; 20,00 mg/l

Process Conditions

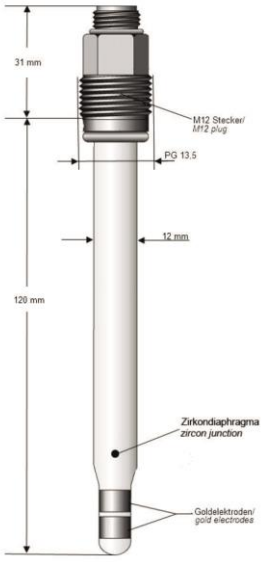
> Max. Pressure: < 10 bar at 20 °C
> Temperature: -5...+70 °C

Mechanical Construction

> Junction: Zirkon
> Shaft Material: Glass
> Shaft Length: 120 mm
> Shaft Diameter: 12 mm
> Electrode Material: 2 Gold Rings
> Reference System: Ag / AgCl / saturated KCl
> Process Connection:
M12 Plug (Swivel PG 13.5)
> Electrical Connection: 6 Poles

Zirkon® DIS

Mechanical Drawing



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CLEAR. CONTROL. CONNECT.

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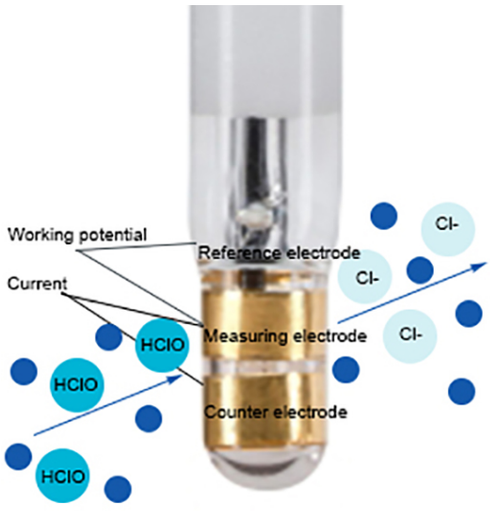
Measurement

The disinfectant measurement by Dr. A. Kuntze GmbH is based on the potentiostatic method.
The instrument applies a potential to the measuring electrode that corresponds to a specific reaction of the disinfectant, leading to an electrical charge on the measuring electrode. Disinfectant particles that hit the electrode surface take away some of the charge. The instrument measures the potential against the reference electrode and readjusts the electrical charge to its intended value. The required current is a direct measure for the concentration of the disinfectant.



The electrodes of the sensors are made from very high-quality, chemically inert materials such as glass, carbon, and precious metals. These electrodes are in direct contact with the water to be measured. Compared with membrane-covered sensors, this design has several advantages:

Stable zero-point and quick response
The measurement is selective for the disinfectant to be measured. In absence of disinfectant it drops to zero. Due to the direct contact with the water the sensor reacts fast to any concentration change – without memory effect.

Pressure-proof and robust
The measuring systems can work under pressure of up to 6 bar and is not affected by long periods without disinfectant. The sensors contain no pressure-sensitive membrane that might tear or get blocked.

Low-maintenance
The sensor design minimizes adhesion of dirt particles and fibers. Additionally, coatings on the electrode surfaces can be prevented with the automatic sensor cleaning ASR®.

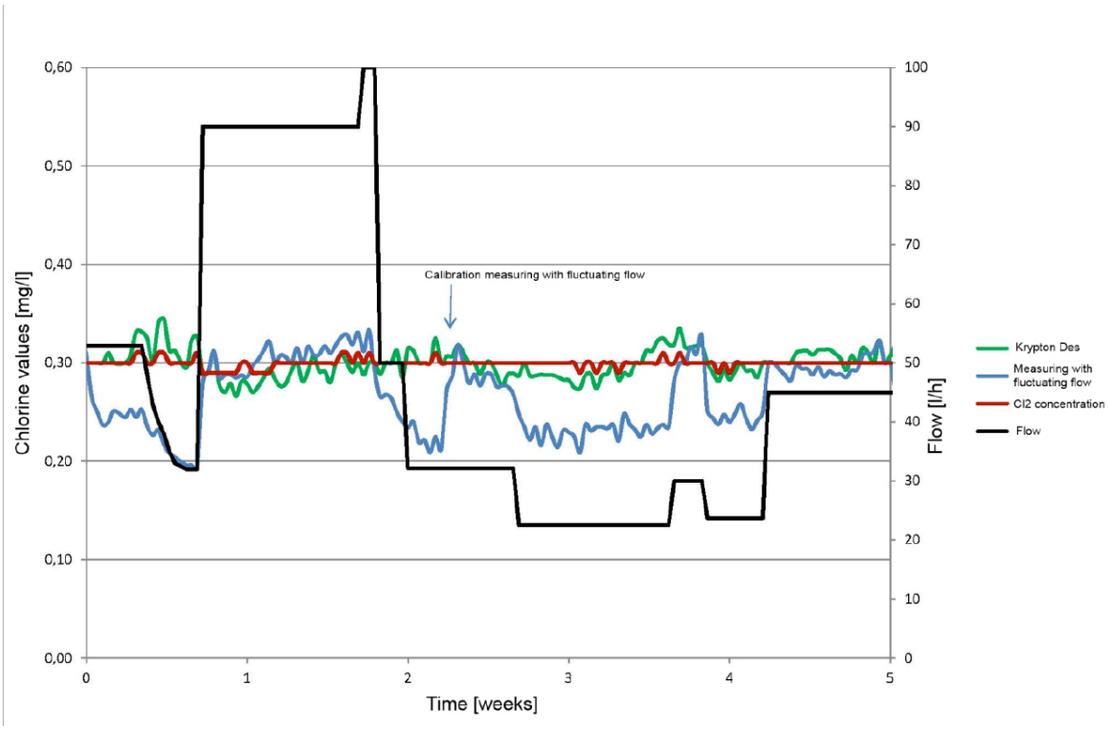
ASR® - automatic sensor cleaning

The automatic sensor cleaning is a patented highly efficient process to clean electrode surfaces.
During the cleaning process, Hydrogen and Oxygen are produced at the electrode surfaces, blasting away even persistent coatings. Additionally, Oxygen oxidizes organic coatings, and Hydrogen reduces organic and inorganic substances, especially iron and manganese oxides.
Excess gas recombines to water and do not interfere with the measurement or the process.

ASR® reduces maintenance requirements:

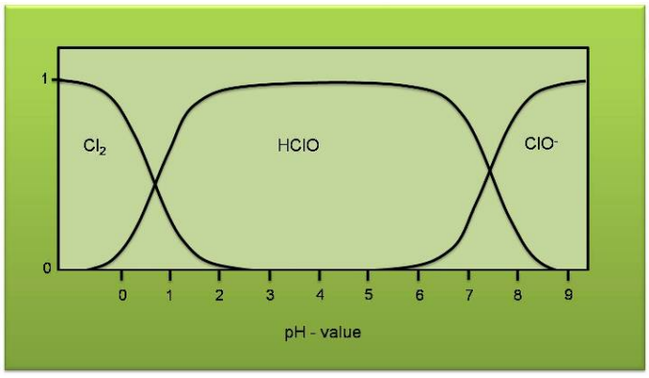
- No manual cleaning
- No exchange/refill of chemical or mechanical cleaning agents
- Drastically prolonged calibration cycles

Flow influence
All disinfectant molecules that hit the electrode surface add to the measured signal. It follows that the measurement is not only dependent on the concentration but also on the flow rate: For a given concentration the measured signal increases with increasing flow rate.
Reducing the flow from 50 l/h to 40 l/h reduces a measured value of 0,3mg/l to 0,28 mg/l. Below 20 l/h the flow influence is much more pronounced.
Therefore in our DES systems Krypton® K und Krypton® K Multi we have set the switch point of the flow monitor to 30 l/h.
In our new assembly Argon® Stabiflow, which is part of the new system Krypton® Des, the flow rate is kept constant at 30 l/h as long as the inlet flow rate does not drop below 35 l/h.



Temperature influence
With increasing temperature the signal increases slightly – at a concentration of 0,3 mg/l a signal change of 0.004 mg/l per °C can be expected (with a slope of 25 mV/0.1 mg).
You can compensate the temperature influence when using a temperature measurement. However, the temperature compensation is mainly useful in cold water applications, to correctly interpret low slope values and to avoid slope alarm messages.

pH influence on the Chlorine measurement
At different pH values, Chlorine forms different species in water. At pH 0, Chlorine is present as Chlorine gas (Cl2) . With increasing pH, the gas reacts with the water to form hypochloric acid. Above pH 2, hypochloric acid is the predominant species.



Above pH 6, the hypochloric acid is neutralized. Hypochloric acid is turned into hypochlorite ions – ClO- . Above pH 9 almost all Chlorine is turned into hypochlorite. The Chlorine measurement detects only the hypochloric acid, not the hypochlorite ions. Therefore the signal strength decreases between pH 6 and 8. For a reliable measurement, pH has to be kept constant or measured and compensated. At constant pH values, the pH influence is taken care of by calibration, which results in a lower or higher slope. At fluctuating pH values, a pH measurement is necessary to allow pH compensation of the Chlorine signal. Howeever, pH compensation is possble only as long as a signal is still detectable. Therefore the pH-range for the Chlorine measurement even with pH compensation is limited to pH 6.. 8. Above pH 8 only higher concentrations can be measured.

Measurement of total Chlorine
Membrane-covered sensors are used to measure total Chlorine. Total Chlorine is the sum of free Chlorine and organically bound Chlorine. Besides Cl2, hypochloric acid and hypochlorite ions this comprises a variety of organic Chlorine compounds that stem from reactions of Chlorine with organic substances in the water.
The total Chlorine measurement shows a noticeably lower pH influence compared with the free Chlorine measurement and can be used in a broader pH range (pH 4.. 12). The measurement takes place in a defined environment after an chemical reaction with Iodide, to allow an equal detection of the various compounds. At the measuring electrode, instead of Chlorine the Iodine produced by the chemical reactions is reduced.

ASR® - automatic sensor cleaning

- **Without manual cleaning**
- **No refill of chemical or physical agents**
- **Strongly reduced calibration demand**

Description

The automatic sensor cleaning is a patented highly efficient process to clean electrode surfaces. During the cleaning process, Hydrogen and Oxygen are produced at the electrode surfaces, blasting away even persistent coatings. Additionally, Oxygen oxidizes organic coatings, and Hydrogen reduces organic and inorganic substances, especially iron and manganese oxides. Excess gas recombines to water and do not interfere with the measurement or the process. For further information check www.automatische-sondenreinigung.de

Information

The ASR can only be used in combination with our sensors AuAu-600-OO-2-1-PG, PtPt-600-OO-2-1-PG and measuring and control instruments for Free Chlorine, Chlorine Dioxide, Ozone and Peroxide .

ASR® - frequently asked questions

Can I use ASR® on coated sensors?
Yes. You can use ASR® for already coated sensors. You might need more than one cleaning cycle. After cleaning you will probably need to recalibrate, because by removing the coating the slope of the sensor can rise. ASR® should be used from the start, to keep the electrodes clean, because then the slope of the sensor is maintained and there is no need to recalibrate.

How many times is a cleaning necessary?
A cleaning once a week is usually adequate. We recommend to raise the number of cleanings only, if the measured values decrease visible within a few days.

Do I need to recalibrate after cleaning?
No. The cleaning is supposed to maintain the original slope of the sensor, not to change it. If the cleaning runs from the start, the slope should change so little over the time that a recalibration is not neccessary. Only calibrate if the value is still much higher immediately before the next cleaning. Generally never calibrate directly after cleaning, so that the calibration does not fall into the abated polarization phase. That`s the reason why we lock the calibration menu for five minutes. During this time the status meassage „cleaning in progress“ is shown in the display.

I cannot use the calibration menu - why?
The measured value is locked for five minutes in the display, in the output signal and also for the controller, in order to give the electrode time to polarize. During this time the status meassage „cleaning in progress“ is shown in the display, and the calibration menue is locked.

Can I use ASR under all circumstances?
The automatic sensor cleaning should not be used ultra pure water or other deionized media.

Is ASR also suitable for sea water?
Yes, we developed a special Zirkon DES pool sensor with platinum-graphite electrodes.

Is ASR available for pH sensors?
No, sorry. The glass membrane cannot be cleaned electrochemically. However, ASR is now available for conductivity sensors.