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Measurement and Control Engineering Chemical Analysis Engineering Technical Support

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Chlorine-Analyzer

HYDROLYT LP 100

Applications

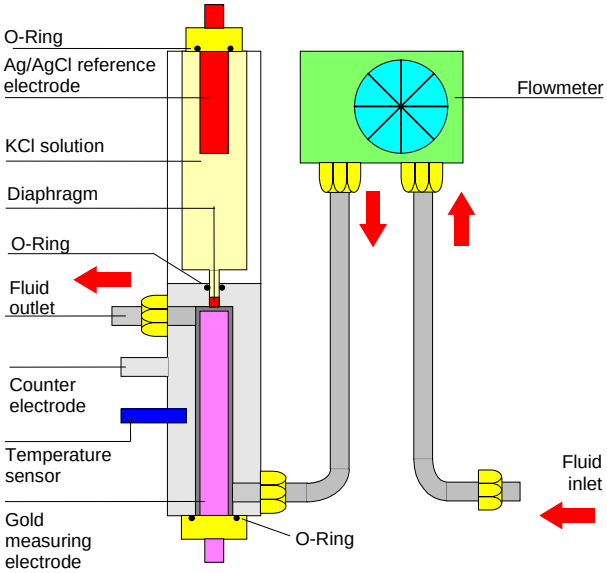
The ozone analyzer of the series HYDROLYT LP 100 is used for automatic, continuous measurement of dissolved free chlorine Cl_2 in aqueous media. The analyzers are used for process monitoring and control, and give alarm when limits are exceeded. Applications are, for example, drinking water treatment, water management in swimming pools or the control of the residual concentration Cl_2 of chlorine-treated waste water. It is important to note that the free chlorine concentration after treatment may not exceed the value of 0,3 mg/l Cl_2.

It should be noted that the free Cl_2 in pH- dependent value (see Figure) relates to hypochlorous acid (HOCl hypochlorite) and its anion.

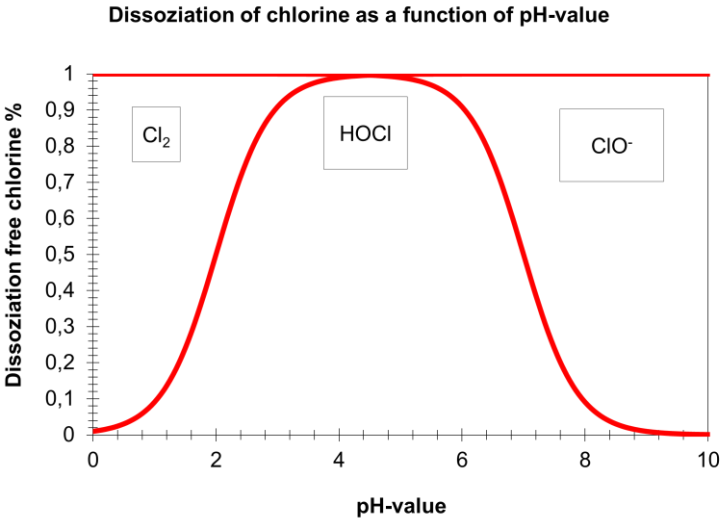
An acidic environment is preferable, because the hypochlorite ion $HOCl^-$ acts significantly less microbicidal than hypochlorite and chlorine-free.

Important for the correct implementation of the disinfection process is an accurate, that means an exact stoichiometric dosage of the required chlorine. By measuring the presence of residual chlorine, the required concentration surplus for a safe disinfection can be kept.

This is also important because chlorine can react with organic substances, but also with ammonia, whereby the amount of available free chlorine for killing bacteria can be reduced considerably. Furthermore, in the reaction of chlorine with organic compounds secondary products are formed, which can be hygienically dangerous (Chloramine).



Measuring cell



Description

During the measurement of the dissolved chlorine (molecular Cl_2) the sample flows through a coaxial designed measurement cell by a gold measuring electrode. If the measuring electrode has a characteristic potential, in the boundary layer (interphase) the measurement reaction takes place. The electrochemical reaction may be represented qualitatively as (cathodic process):

$$Cl_2 + 2e^- \Leftrightarrow 2Cl^-$$

The electrochemical sensor functions in a potentiostatic mode with an open three-electrode system (no membrane). Consequently, exact and reliable measurements can be accomplished at pressures (up to 10 bar) and in areas where pressure spiking takes place.

The calibration of the sensor can be performed in two ways. First by a parallel titration determination of the chlorine concentration (classical laboratory method) or by a photometric determination and subsequent input of the current value into the instrument. Second, by using a calibration solution with a known concentration.

This sturdy and reliable measurement system makes it possible to operate accurately even under harsh conditions.

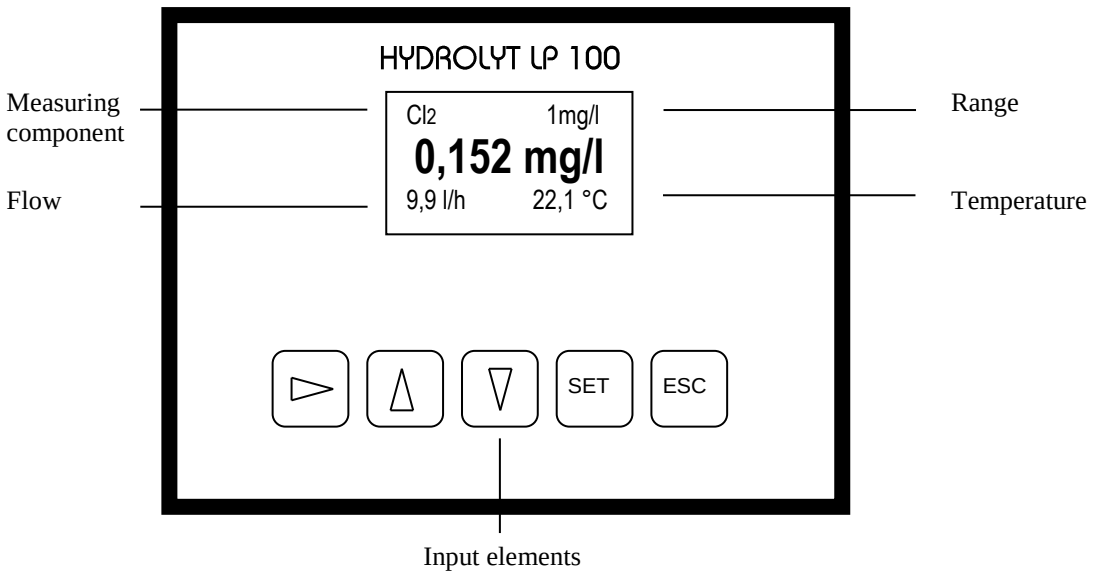
The sensitivity of the electrode can be restored easily by cleaning the electrode with a mild detergent.

HYDROLYT LP 100

Features

- Measurement range from the trace up to saturation levels
- Automatic compensation for flow and temperature effects; high degree of automation
- High resolution and quick response time (no membrane)
- On-line unit available as a either portable or wall mounted instrument
- No zero point adjustments needed; low maintenance
- Resists pressure up to 10 bar (145 psi)
- Measurement data processing through modern micro processing; data logging function
- Analogue and digital interface; data logging function

Front view



Technical data

Measurement principle:.....	microprocessor based, potentiostatic three electrode system
Calibration:.....	build-in, single button operation and AutoCal
Auto-calibration:.....	option
Measuring range:	
Measuring group I:.....	0,0.....1000,0 µg/l
	range selectable between 20....1000 µg/l
Measuring group II:.....	0,000.....10,000 mg/l
	range selectable between 0,1....10 mg/l
Analog output:.....	0(4).....20 mA; shunt max. 500 Ohm
Digital output:.....	serial interface RS 232
Data logging:.....	option
Limit:.....	power relay
Alarming:.....	power relay; Flow and Calibration
Measuring electrode:.....	gold
Counter electrode:.....	stainless steel 1.4571 (314)
Reference electrode:.....	Ag/AgCl in saturated KCl-solution
Response time t_{90}:.....	30 sec
Probe conductivity:.....	≥10 µS/cm; (if conductivity is less a salt cell is required)
Ambient temperature:.....	0.....+55 °C
Probe temperature:.....	0.....+60 °C
Probe pressure:.....	≤ 10 bar (145 psi)
Probe flow:.....	3 l/h .....18 l/h
Probe fittings:.....	tube fittings for tube ∅ 6 mm
Error limits:.....	± 3%
Protection class:.....	IP 54
Color:.....	basic parts RAL 7035; front and rear parts RAL 7024
Voltage:.....	100..240 VAC, 50/60 Hz
Power consumption:.....	10 VA

Technical subject to change without notice