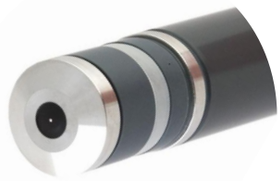
HaloSense

Total and Free Chlorine Analyzer

The HaloSense range of Residual Chlorine Analyzers, Residual Chlorine Controllers and Residual Chlorine Monitors utilize the very latest and best chlorine sensors available in the world today. They are membrane devices which are insensitive to changing pH, use no reagents, are extremely stable, and have reduced maintenance and reduced whole life costs.

- **Amperometric sensors - accepted under US EPA method 334.0**
- **No chemical reagents - lower cost of ownership**
- **Stable and reliable - excellent process control**
- **Suitable for all potable, process and salt waters**
- **Up to 1 year between maintenance (free and total)**
- **Up to 6 months between calibration**
- **Up to 15 years life - reduced costs**



"In my opinion the Pi chlorine analyzers are simply the best in the world"

John Clark, USA

The HaloSense sensors and flow cells are available with different controllers giving you the same great performance with different communication, display, and control options. With the HaloSense range of residual chlorine analyzers, you get an extremely sophisticated chlorine analyzer, chlorine monitor and chlorine controller.

CRONOS® HaloSense

- High Quality - Lowest Cost
- Multilingual
- High resolution grayscale display
- 9 buttons for easy navigation
- Graphing and datalogging
- Enclosure; wall, panel, pipe or pole mounting. IP65/Nema 4x.
- Options:
  - **Modbus RS485/LAN**
  - **Profibus DPV 1**
  - **Up to 2 sensors**
  - **PID/flow proportional controls**
  - **Remote sensors**
  - **Color display**
  - **Downloadable data logs**

CRIUS® HaloSense

- Highest Quality - Low Cost
- Multilingual
- High resolution color display
- Intuitive user interface
- Downloadable data logs
- Customizable home pages
- All CRONOS® options plus:
  - **Up to 4 sensors**
  - **Remote access via LAN**
  - **Remote access via 3G/4G**
  - **Expandable to 16 sensors**

For more information please see the individual brochures for CRONOS® and CRIUS®

Mounting Options

- Open overflow cell (single, double or triple)

- Single closed flow cell

- Single or double Autoflush

www.processinstruments.net

Principle of Operation

The membraned amperometric chlorine sensors, are enhanced with a third, reference electrode which eliminates zero drift. Its unique design means that pH correction is not usually required at all, completely eliminating reagents.

In addition to the state of the art potentiostatic chrono-amperometric free chlorine and total chlorine sensors, the HaloSense range of residual chlorine analyzers has all the functionality that you need, and more. Simply choose the CRONOS® or CRIUS® controller to give you the highest quality chlorine analyzer, with all the functionality you need at the lowest price possible. This means that you pay for everything that you need and nothing you don't, without sacrificing the quality of measurement!

CO_2 Buffering

An alternative to pH compensation is the use of CO_2 to suppress the pH such that changes in the pH of the sample do not affect the chlorine reading.

Water Treatment

- **Chlorine Dosing**
- **Cooling Towers**
- **Paper Mills**
- **Remote Sites**
- **Food Preparation**
- **Secondary Chlorination**

Specification*

**** All subject to change without notice***

	Free	Total	Zero
Type:	Membrane covered potentiostatic chrono amperometric three-electrode system		
Range (ppm):	0.005-2, 0.05-5, 0.05-10, 0.05-20, 0.5-200	0.005-0.5, 0.005-2, 0.05-5, 0.05-10, 0.05-20	0.005-2, 0.05-20
Resolution:	0.001, 0.01, 0.1	0.001, 0.01	0.001, 0.01
Stability:	Approx. -1% per month	Approx. -1% per month	Approx. <-3% per month
Working electrode:	Gold	Gold	Gold
Counter electrode:	Stainless Steel	Stainless Steel	Stainless Steel
Reference electrode:	Silver/Silver halide	Silver/Silver halide	Silver/Silver halide
Membrane material:	Micro-porous hydrophilic membrane	Micro-porous hydrophilic membrane	Micro-porous hydrophilic membrane
Flow rate:	Approx. 500ml min	Approx. 500ml min	Approx. 500ml min
Temperature range:	0-45°C	0-45°C	0-40°C
Temperature compensation:	Automatically by an integrated thermistor	Automatically by an integrated thermistor	Automatically by an integrated thermistor
pH-range:	pH 4 up to pH 9	pH 4 up to pH 12	pH 6.5 up to pH 9
First-polarisation time:	Approx. 2 hours	Approx. 2 hours	Approx. 2 hours
Re-polarisation time:	Approx. 30 minutes	Approx. 30 minutes	Approx. 30 minutes
Response time:	T_{90}: approximately 120 seconds	T_{90}: approximately 120 seconds	T_{90}: approximately 120 seconds
Zero-point adjustment:	Not necessary	Not necessary	Not necessary
Calibration:	DPD-1-Method	DPD-4-Method	DPD-1-Method (if no chlorine allowed use EKV-1 and DPD-1- Method)
Housing material:	PVC-U, stainless steel, microporous hydrophilic membrane, silicone	PVC-U, stainless steel, microporous hydrophilic membrane, PEEK, silicone	PVC-U, stainless steel, microporous hydrophilic membrane, PEEK, silicone
Dimensions:	Diam. 25mm, length 190mm	Diam. 25mm, length 190mm	Diam. 25mm, length 195mm
Maintenance intervals:			
Membrane:	Once a year	Once a year	Once a year
Electrolyte:	Once a year	Once a year	3-6 months
Interferences:	ClO_2, O_3	ClO_2, O_3	ClO_2, O_3, reducing agents

The HaloSense chlorine analyzer range is particularly suited to working in sites where reliability and ease of use are most important.

Autoflush

As described in a separate brochure, the HaloSense can come equipped to automatically clean itself at user defined intervals with all the benefits of no operator intervention. The Autoflush is particularly useful in food preparation, pulp and paper, waste water and many applications where there is likely to be a build up of solids in the sample.

pH Compensation

For some applications with high and variable pH, pH compensation can improve the accuracy of the chlorine readings. For pH compensation to be valid it must be done with the highest quality pH sensors and with chlorine sensors that have a reduced susceptibility to varying pH, such as those used in the HaloSense range of chlorine analyzers.

Installation

The HaloSense can be installed in a variety of auxiliary flow cells and self-cleaning devices. Please ask for details.

Common option for Zero is solenoid value on a timer/scheduler to prevent depolarization.