HaloSense

Total and Free Chlorine Analyser

The HaloSense range of Total and Free Residual Chlorine Analysers and Monitors are equipped with 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 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 year life -** reduced costs

The HaloSense sensors and flow cells are available with different controllers giving you the same great performance with different communication, display and control options including; relays, digital inputs, analogue outputs, LAN and modem connections with Modbus, Profibus and MQTT comms protocols.

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

John Clark, USA

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**
  - **Colour display**
  - **Downloadable data logs**

CRIUS®4.0 HaloSense

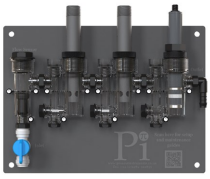
- High Quality - Lowest Cost
- Multilingual
- High resolution colour display
- Intuitive user interface
- Downloadable data logs
- Customisable home pages
- All CRONOS® options plus:
  - **Up to 4 sensors**
  - **Remote access via LAN**
  - **Remote access via 3G/4G**
  - **Expandable to 16 sensors**

For more information please see the individual brochures for CRONOS® and CRIUS®4.0

Mounting Options

Single flow cell (open or closed)

Double flow cell (open or closed)



Triple flow cell (open or closed)

Single or double sensor Autoflush

Principle of Operation

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

In addition to the state-of-the-art potentiostatic chronoamperometric chlorine sensors, the HaloSense range of residual chlorine analysers has all the functionality that you need and more. Simply choose the CRONOS® or CRIUS®4.0 controller to give you the highest quality chlorine analyser 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!

The free chlorine sensor measures free chlorine when there is a constant residual. If your process has periods when there is no chlorine residual present, or if you are measuring free chlorine breakthrough, then the Zero is the best sensor to use.

Applications

- **Drinking Water**
- **Cooling Towers**
- **Paper Mills**
- **Remote Sites**
- **Food Preparation**
- **Secondary Chlorination**

The HaloSense chlorine analyser range is particularly suited to sites where reliability and accuracy 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 other applications where there is likely to be a build up of solids in the sample.

Installation

The HaloSense can be installed in a variety of auxiliary flow cells and self-cleaning devices. This allows it to work in extremely challenging applications such as vegetable/salad washing and white water monitoring in paper manufacturing. Please ask for details.

Key Benefits

- **Low cost of ownership**
- **Reduced pH dependency** *(largely pH independent)*
- **Stable and reliable**
- **Bufferless**
- **Reagentless**

For more information and to discuss your application, process control requirements and any remote communications please contact Pi and talk to one of our technical specialists.

Specification*

	Free Chlorine Sensor	Total Chlorine Sensor	Zero Chlorine Sensor
Type:	Membrane covered potentiostatic chronoamperometric 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
Resolution:	0.001, 0.01, 0.1	0.001, 0.01	0.001
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
Initial 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 180 seconds	T_{90}: approximately 2 mins
Zero-point adjustment:	Not necessary	Not necessary	Not necessary
Calibration:	DPD-1-Method	DPD-4 -Method (DPD-1 + DPD-3)	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 = 0.75 O_3 = 0.8	ClO_2 = 1 O_3 = 1.3	ClO_2, O_3, reducing agents

All subject to change without notice