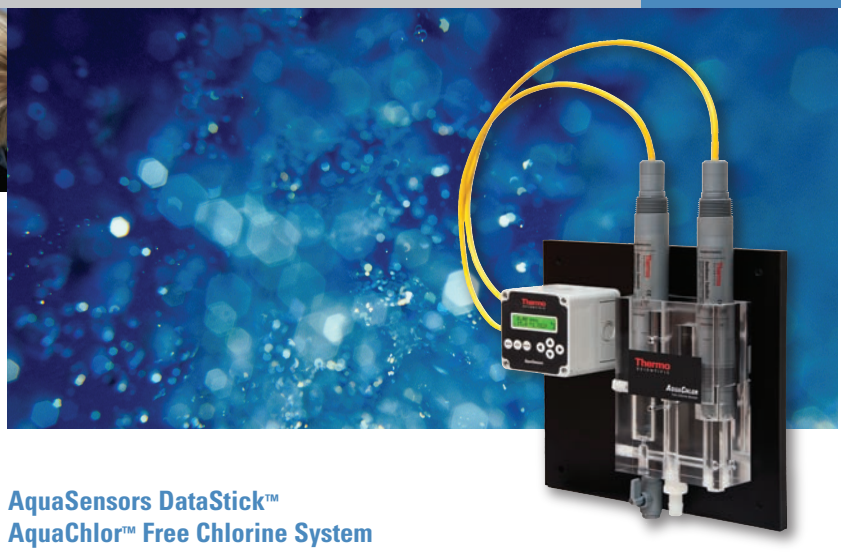
Thermo Scientific AquaSensors
DataStick measurement system
for universal plug & play

Product Specifications

Thermo Scientific AquaSensors DataStick

AquaChlor Free Chlorine Sensor and Monitoring System



Markets/Applications

- Drinking water
  – Production & distribution
- Food & beverage
  – Monitor sanitized process water
  – Monitor sterilization of glassware
- Reverse osmosis/ultrapure water
  – Chlorine damages filter membranes

AquaSensors DataStick™ AquaChlor™ Free Chlorine System

- Reagent-free amperometric design
- Compliant with EPA Method 334.0 for online drinking water monitoring
- Manual or Automatic pH compensation
- Temperature compensated
- Pre-calibrated, Plug & Play Sensors
- Rugged Teflon membrane in replaceable sensor cap
- Remote measurement, calibration, configuration and diagnostics
- Convenient turn-key AquaChlor monitoring system for optimal performance

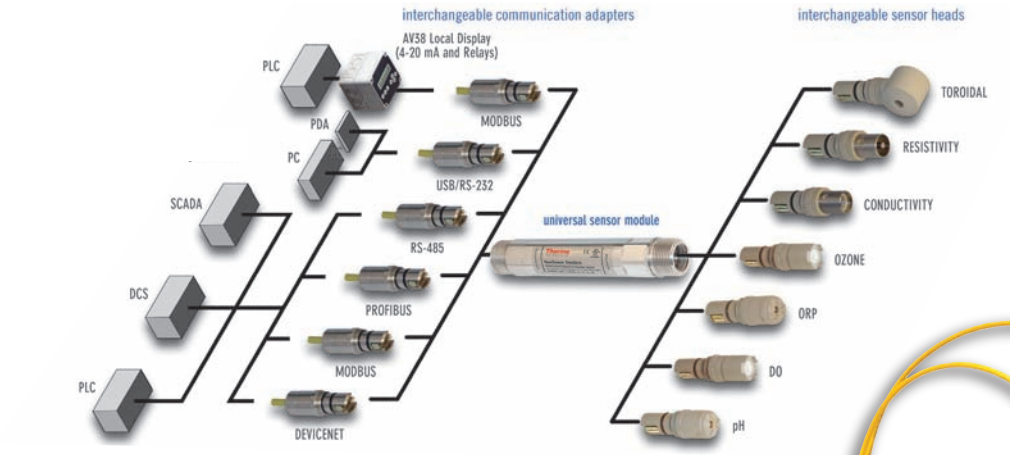
This free chlorine sensor will measure accurately in clean water processes between 4 and 9 pH. Best performance is achieved when used in applications where process pH, temperature, flow and pressure are stable.

When used with the Thermo Scientific AV38 Local Display/Controller and a pH DataStick sensor, measured hypochlorous acid (HOCl) and hypochlorite ion (OCl-) concentrations can be used to determine free chlorine levels present.

Engineering Specifications

1. The free chlorine measurement system shall employ the amperometric measurement technique, using a gold cathode and silver anode.
2. The sensor shall have hex-shaped wrench flats to facilitate mounting, and shall continuously measure hypochlorous acid (HOCl) and temperature in water to determine free chlorine concentration. When combined with pH measurements the sensor shall also determine total free chlorine concentration.
3. The free chlorine sensor and packaged monitoring system shall be compliant with EPA Method 334.0 for online chlorine monitoring in drinking water applications.
4. The sensor shall sample continuously at a user-regulated flow rate between 200 and 250 mL per minute, and automatically pH compensate over process solutions between 4.0 and 9.0 pH.
5. The system shall be a reagent-free design, requiring no additional buffers or indicators for free chlorine measurement.
6 The system shall display from 0-10 ppm on an LCD display with backlighting.
7. The minimum detection limit for free chlorine shall be 0.03 ppm.
8. The accuracy shall be within 3% of the measured sample from pH 4.0 to 7.2 (constant value) and within 10% of the measured sample up to pH 9.0 (constant value).
9. The sensor shall have an integral temperature sensor to measure temperature independently.
10. The analyzer shall automatically compensate for sample temperature that shall be between 0° and 45 °C.
11. The calibration method for the free chlorine sensor or system shall be with an approved laboratory method.
12. The local display/controller enclosure shall be rated at NEMA 4X.
13. The sensor shall have a built-in pre-amplifier, universal signal conditioning electronics, universal engineering units conversion, and interactive communications with a host computer or display interface using one of several protocols including Modbus® RTU, DeviceNet Profibus, USB, CANopen or Ethernet IP.
14. The system shall have two isolated 4-20 mA analog outputs that can represent the measured free chlorine as well as measured pH (if pH sensor is also used). Temperature may also be assigned to one of these outputs.
15. The system shall have two available relays that can be selected to operate as a control, alarm, or timer relay.
16. The Thermo Scientific AquaChlor™ System shall be AquaSensors Model AQC-series with Free Chlorine DataStick and optional pH DataStick.

Thermo Scientific DataStick Analytical System



Key Components

DataStick

Provides universal conversion of sensor signals and interactive communications for measurement, calibration, configuration and diagnostics.

Communications Adapter

Plugs into the DataStick to provide power and direct interactive communications with control systems.

AV38 Local Display

2 line display and 7 key navigation. Data reporting with up to 2 current outputs. 2 Form C relays. Digital communications.

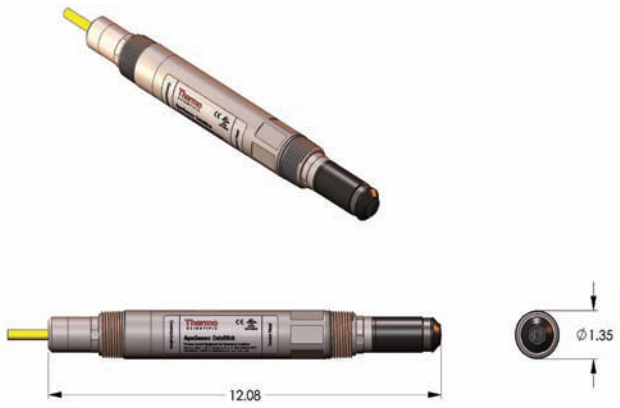
AquaChlor System

With free chlorine and pH DataStick sensors installed.

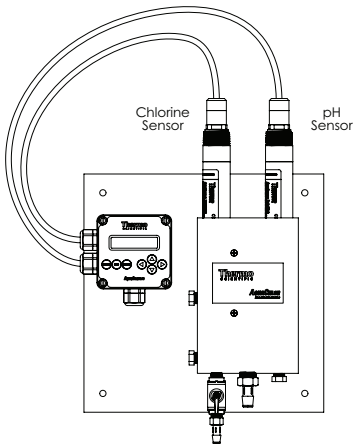
Free Chlorine Sensor Head

Pre-calibrated for free chlorine and temperature. Can be plugged into any DataStick™ to yield accurate 24-bit data.

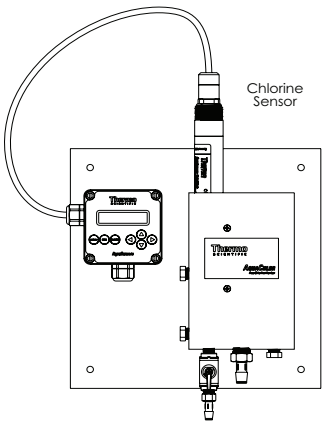
Thermo Scientific AquaSensors
Free Chlorine DataStick



Provides universal conversion of sensor signals and interactive communications for measurement, calibration, configuration and diagnostics. Mounting adapters, junction boxes and recharge kits are available.



AquaChlor System with free chlorine and pH DataStick sensors installed.



AquaChlor System with free chlorine DataStick sensor only.

Specifications	
Measurement System Performance	**Measurement Range:** 0 to 10 ppm **Resolution:** 0.01 ppm **Minimum Detection Limit:** 0.03 ppm **Accuracy:** ±3% of measured sample (at constant pH 4.0 to 7.2) ±10% of measured sample (at constant pH up to 9.0) **Step Response Time:** 90% in 90 seconds
Operational Environment	**Temperature Range:** 0 °C to 45 °C (32 °F to 113 °F) **Maximum Pressure:** 15 psig @ 45 °C **Sample Flow Rate in Chamber:** 200 to 250 mL/min
Free Chlorine Operation	When chlorine and pH DataSticks are connected to the AV38 local display, HOCl and OCl^- dissociation curves are pH compensated and used to calculate free chlorine present. A stable pH value can also be entered manually.
DC Power Requirements (option)	**Voltage Range:** 10 to 30 VDC **Maximum Power:** 200 mW **Typical Power:** 120 mW
AC Power Requirements (option)	**Voltage Range:** 90 to 240 VAC 50/60 Hz; 4 Watts
Construction	**Process Electrodes:** Gold cathode, silver anode **Membrane:** Teflon® **O-rings:** Viton® **Flow Chamber:** Acrylic **Sensor Head Material:** Noryl® **DataStick Material:** CPVC **Weight:** 1.2 lbs
Units of Measure	**Measurement units:** ppm **Temperature Units:** °C, °F
Calibration‡	**Sample:** 1 point **Zero:** 1 point **Temperature**: 1 point
Other Configuration Options	**Sensor Filter:** 0 to 100 seconds **Temperature Filter:** 0 to 100 seconds
Approvals and Ratings	**Immunity & Emissions:** CE Certified 89/336/EEC: CISPER 11, EN61000 (-4-2,-4-3,-4-4,-4-6, 4-8) **Safety:** cULus Listed; 367G E303570 **Hazardous Locations:** Haz Loc Class 1, Division 2, Groups A, B, C, D. Max Ambient 50 °C

‡ Note: Precalibrated at the factory

Thermo Scientific AquaSensors Free Chlorine DataStick and AquaChlor Monitoring System

Global support — with experience that comes from supporting our customers for over 35 years throughout the world, our water quality specialists and customer support teams offer a quick, thorough and professional response to any problem encountered.

Focus on user benefits — we work closely with you to define your needs, and ensure you are using the monitor in a way that improves your bottom line. For more information, contact your local water quality specialists or visit www.thermoscientific.com/water.

AquaChlor Free Chlorine Systems

Part No.	Description
AQC-d-x-y-z	**AquaChlor Systems**
Free chlorine measurement system with precalibrated chlorine and optional pH sensor heads, integrated temperature compensation with DataStick module(s), low flow sample chamber, mounting plate and local display/controller.	
Display Configuration (d)	1 = Integral mount 2 = Remote mount with 20 ft cable
AV38 Display Configuration (x)	A = 1 current output; 24 VDC power B = 2 current, 2 relays; 24 VDC power C = 2 current, 2 relays; 100 to 240 VAC power
AV38 Host Communications (y)	0 = None 4 = Modbus RTU (RS-485) 5 = DeviceNet 6 = CANopen 7 = EtherNet IP, Modbus/TCP, TCP/IP
pH Compensation (z)	A = Manual B = Automatic (with active pH sensor)

Part No.	Description
	Recommended AquaChlor Systems
Below are examples of part numbers for configuring a typical free chlorine measurement system.	
AQC1A0A	AquaChlor System, Integral AV38 with one current output, flow chamber, manual pH, 24 VDC.
AQC1C0B	AquaChlor System, Integral AV38 with two current outputs, two relays, flow chamber, automatic pH, 100–240 VAC.

Accessories Ordering Information

Part No.	Description
	Chlorine Electrolyte
RDOK9	Chlorine Electrolyte, 60 mL bottle
	Membrane Caps
DMRO9	Chlorine Membrane Cap
SBCO1	Storage Cap With Sponge

S-ASDSFRCL-E 0310 RevB

Process Water Instruments

North America
166 Cummings Center
Beverly, MA 01915 USA
Toll Free: 1-800-225-1480
Tel: 1-978-232-6000
info.water@thermo.com

Netherlands
Tel: (31) 033-2463887
info.water.uk@thermo.com

China
Tel: (86) 21-68654588
wai.asia@thermofisher.com

India
Tel: (91) 22-4175-8800
wai.asia@thermofisher.com

Singapore
Tel: (65) 6778-6876
wai.asia@thermofisher.com

Japan
Tel: (81) 045-453-9175
wai.asia@thermofisher.com

www.thermoscientific.com/water