

# CA610 Fluoride Analyzer

Fluoride

## Features and Benefits

### Reliable, Full-time Fluoride Monitoring

The CA610 Fluoride Analyzer uses advanced ion-selective electrode (ISE) technology for continuous monitoring of fluoride concentration in drinking water effluent. Accuracy is ensured with precise control of temperature, ionic strength, and pH. Interferences that can bias measurements are virtually eliminated with this electrode.

### Patented Electrode Design with Replaceable Tip

The proven ISE technology of the electrode is enhanced by a patented\* design and manufacturing process. The lanthanum crystal at the tip of the probe is molded into a one-piece, monolithic tip that is threaded for easy removal. This prevents errors and premature failures. Electrodes are equipped

with BNC connectors so that they can be independently checked with laboratory electrochemical meters.

### Cost Effective Operation

The electrode of the CA610 analyzer is made with a molded fluoride crystal tip. The working life of the electrode is approximately one year. The specially designed tip of the electrode should be replaced every six months. Reagent consumption is very low and maintenance is simple.

### Method of Analysis

The ISE system of the CA610 analyzer includes a reference pH electrode and a working electrode. Three reagents are used—Total Ionic Strength Adjustment Buffer (TISAB) solution and two fluoride standards. The TISAB is used for the following purposes.

- Ionic strength adjustment lets the electrode respond to concentration instead of activity.
- pH control ensures fluoride is present in its ionic state.
- Weak complexes formed by certain metals (for example, aluminum) are “broken up” by TISAB and chelates potential interferences for accurate fluoride measurement.



*The Hach CA610 Fluoride Analyzer offers economical analysis using just 500 mL of reagent per month. Calibration is automatic and sample conditioning is built-in. Electrode maintenance is easy and economical—just replace the tip of the sensor.*

DW

### Automatic Calibration

Two calibration standards are fully enclosed in the CA610 analyzer's case. The instrument performs a 2-point calibration at 0.5 and 5.0 mg/L fluoride at user-selected time intervals. Automatic calibration intervals can be set for 1 day to 1 month. Readings and calculations of the most recent calibration is stored in the instrument.

IW

### Applications

**Drinking Water Plants**—The CA610 analyzer accurately measures fluoride concentration regardless of the form in fluoride is added—liquid fluorosilicic acid ( $H_2SiF_6$ ), sodium silicofluoride ( $Na_2SiF_6$ ), or sodium fluoride (NaF).

**Remote Locations**—Because it produces only a small amount of waste and requires minimal maintenance, it is well-suited for remote locations.

**Industrial Locations**—Fluoride may occur naturally in water or it may be the result of fertilizer run-off or discharge from aluminum factories. The CA610 analyzer is an effective tool to monitor either influent or effluent stream.

\*US patent number 5,393,402

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

## Specifications\*

### Range

0.1 to 10 mg/L fluoride

### Accuracy

±10% or ±0.10 ppm whichever is greater

### Precision

±7% or ±0.07 ppm whichever is greater

### Minimum Detection Limit

0.10 mg/L

### Cycle Time

4.2 minutes

### Sample Conditioning Inlet Pressure

1 to 10 psig (use sample restriction device to reduce higher pressure samples)

### Sample Flow Rate

200 to 500 mL/minute  
(200 mL/min minimum required)

### Sample Temperature

5 to 40°C (41 to 104°F)

### Operating Temperature

5 to 40°C (41 to 104°F)

### Operating Humidity

90% at 40°C (90% at 104°F) maximum

### Storage Temperature

-40 to 60°C (-40 to 140°F)  
(without reagents)

### Sample Inlet Connection

1/4-inch OD polyethylene tubing,  
quick-disconnect fitting

### Drain Connection

1/2-inch ID flexible hose

### Air Purge (optional)

0.1 cfm instrument quality air at 20 psig maximum, 1/4-inch OD tubing,  
quick-disconnect fitting

### Reagent/Standard Requirements

*Maximum Reagent Usage:* 500 mL/month for each of two standards and one reagent TISAB

*Containers:* High-density polyethylene (3) 500 mL bottles

*Containment:* Reagent bottle contained inside analyzer enclosure, vented externally

### Calibration Method

Two-point log/linear using 0.5 mg/L and 5.0 mg/L fluoride standards

### Display

LCD, 3-1/2-digit measurement readout and six-character alphanumeric scrolling text line

### Alarms

Two SPDT relays (unpowered.), 5A resistive load at 240 Vac. Suitable for sample set point alarms (high or low) or system warning indicator or system alarm indicator.

### Recorder Output

One isolated recorder output, 4–20 mA (can be adjusted to 0–20 mA); maximum impedance 500 ohm, 130 V isolation from earth ground. Output span is programmable over any portion of the measurement range.

### Optional External Outputs

Hach AquaTrend® Network Interface

### Power Requirement

100 to 115/230 Vac selectable, 90 VA maximum, 50/60 Hz, 2.5 Amp fuse

### Power Connection

Three-wire barrier terminal block through 1/2-inch conduit hole in case; wire range: 12 to 18 AWG

### Compliance/Certification

CE approved, ETL listed to UL 1262, ETL certified to CSA 22.2 No. 142

### Enclosure

Molded ABS plastic, IP62-rated (dust and drip tight) with gasketed door latched. Suitable for indoor applications.

### Mounting

Wall mount

### Installation

Category II

### Dimensions

34.3 x 41.9 x 19.1 cm  
(13.5 x 16.5 x 7.5 in.)

### Shipping Weight

11.3 kg (25 lb.)

\*Specifications subject to change without notice.

## Engineering Specifications

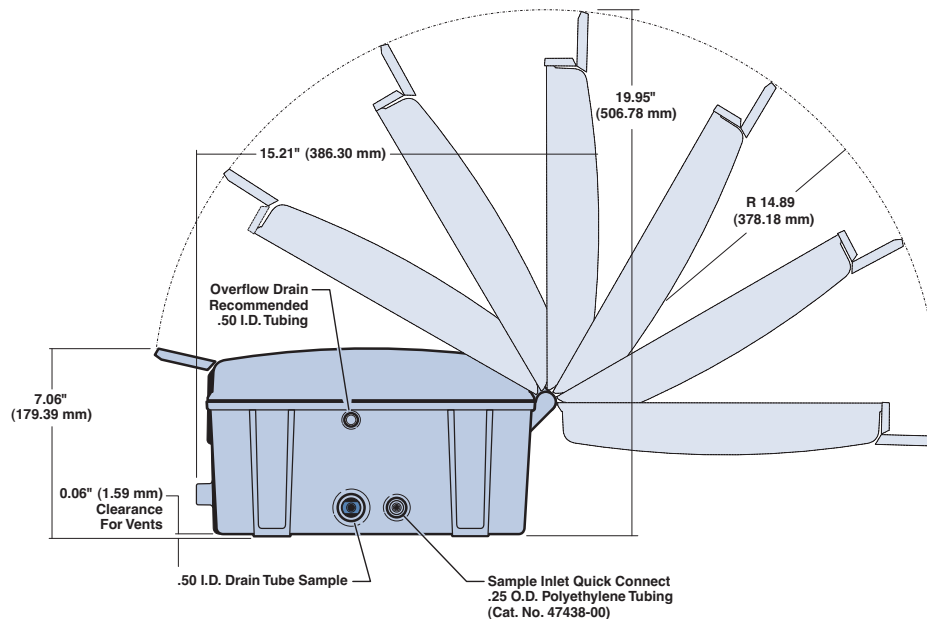
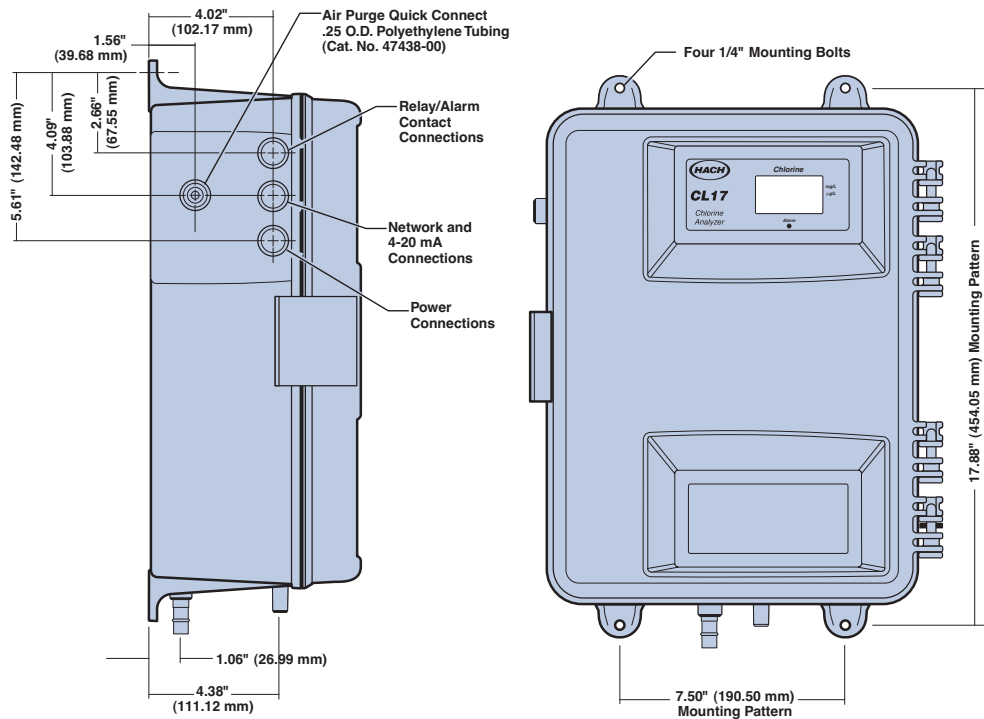
- The fluoride analyzer shall employ an ion-selective electrode method of measurement using TISAB reagent and be capable of measuring fluoride every 4.2 minutes.
- A three digit LCD readout in the range of 0.1 to 10 mg/L shall display the results.
- The analyzer shall be designed for 30 days unattended operation and use only 500 mL of each standard every two months when the calibration interval is set for 24 hours.
- Operating with a lanthanum fluoride crystal, the working electrode shall employ a removable sensor for easy replacement.
- The instrument shall be constructed with a temperature controlled, wall-jet flow cell to guide the sample directly toward the surface of the electrode to assure fast wash out.
- The instrument shall provide resolution of 0.1 mg/L, repeatability within ±0.07 mg/L, and accuracy better than ±10% of reading or ±0.10 mg/L, whichever is greater.
- The analyzer shall be microprocessor-controlled and provide a 4-20 mA recorder output as well as 2 alarms.
- Each alarm shall be user-selectable for sample concentration alarms (high or low), analyzer system warnings, or analyzer system errors.
- The sample concentration alarms shall be fully adjustable through the entire range.
- The system warning shall activate for minor variations in analyzer performance.
- The system alarm shall activate for major variations in analyzer performance and it shall shut down the analyzer until corrective action is taken.
- The microprocessor shall provide self-diagnostic functions accessible through an alphanumeric, menu-driven keyboard.
- Two SPDT normally open/normally closed dry contact relays rated at 5 A resistive load at 230 Vac shall be provided.

## Engineering Specifications *continued*

11. Recorder outputs shall be 4-20 mA. Recorder span minimum and maximum values shall be operator programmable at the menu-driven keypad over the entire operating range.
12. The fluoride analyzer shall be housed in an IP62-rated, ABS plastic enclosure designed for wall mounting.
13. The enclosure shall have two clear polycarbonate windows for viewing the measurement readout and reagent levels.
14. Power requirements shall be 100 to 115/230 Vac, 50/60 Hz, switch selectable, 90 VA maximum.
15. The fluoride analyzer shall be Hach Company model CA610 Fluoride Analyzer.

## Dimensions

The CA610 analyzer is designed to be wall-mounted with four 1/4-inch screws. Adequate clearance must be left at the sides and bottom of the case for plumbing and electrical connections. The sample inlet connection is 1/4-inch quick-disconnect fitting and the drain connection is 1/2-inch I.D. flexible hose. Electrical connections are inside the instrument case. Holes for three 1/2-inch conduit fittings are provided.



## Ordering Information

CA610 Fluoride Analyzers are shipped with one-month supply of reagents, maintenance kit, wall mounting kit, and manual. Power cord is ordered separately.

- 5740001** Model CA610 Fluoride Analyzer  
**5740002** Model CA610 Fluoride Analyzer with AquaTrend Network

For European customers:

- 5740011** CA610 unit, Reagents Set, Installation & Maintenance Kits, EU Basic User Manual  
**5740005** CA610 unit, Installation & Maintenance Kits, EU Basic User Manual – NO REAGENTS

### Accessories

- 5448800** Power Cord, 115V, 10A, 1.83 m (6 ft.), North American plug  
**5448900** Power Cord, 230V, 10A, 1.83 m (6 ft.), Continental European plug  
**4643600** Flow Meter with 1/4-inch OD tubing

### Replacement Items

- 5742100** Maintenance Kit (See Note 1)  
**5744400** Pump Tubing Set  
**5742700** Instrument Tubing Set  
**5744800** Electrode Kit (See Note 2)  
**5528100** Electrode, pH reference  
**5527700** Electrode Body, ISE  
**5745100** Electrode Tip, fluoride lanthanum crystal, 2/pkg

### Additional Reagents

One unit of each standard solution is sufficient for two months operation at a 24-hour calibration interval. One unit of Reagent 1 TISAB is sufficient for a 30-day operating period.

- 2816900** Reagent Set, CA610 fluoride analyzer (includes reagent 1 TISAB, standard 1, and standard 2)  
**2812811** Reagent 1 TISAB, 473 mL  
**2743811** Standard 1, 0.5 mg/L as F, 473 mL  
**2797111** Standard 2, 5.0 mg/L as F, 473 mL  
**4450126** Inner Fill Solution, fluoride, 50 mL

### NOTES

- Kit includes instrument and pump tubing sets (1 year supply), replacement filter screen, and spare fittings.
- Kit includes ISE and pH electrodes, electrode tips, syringe, and inner fill solution.

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.



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**Make it simple.**

**Be right.**

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