

AZTEC® Fluoride Monitor Series F1000



CAPITAL CONTROLS



- ◆ Ion selective fluoride sensing electrode
- ◆ Automatic high and low calibration
- ◆ Continuous on-line fluoride monitoring
- ◆ Microprocessor-based
- ◆ Dot-matrix graphical display
- ◆ Automatic ranging to 100 mg/l
- ◆ Data logging and trending
- ◆ Separate electronics and liquid processing compartments
- ◆ On-screen instruction & self diagnostics
- ◆ Six programmable alarm relays
- ◆ Regulated sample temperature

The Capital Controls AZTEC® F1000 Fluoride Monitor is reliable, accurate, on-line process instrument representing the latest technology in continuous fluoride monitoring. The microprocessor-based electronics include on-screen instruction and self diagnostics to make operation easy and user-friendly. The measurement is provided with an ion-selective fluoride sensing electrode based on the fluoride method outlined in the 18th Edition of "Standard Methods".

The AZTEC® F1000 Fluoride Monitor features a large dot-matrix graphical display with automatic ranging capabilities from 0-100 mg/l. Display resolution is up to 0.001 mg/l with an optional graphical viewing mode. Six adjustable alarm relays and a 4-20 mAdc output signal are standard. All user controls are provided through four membrane buttons on the display face.

Accuracy and reproducibility are obtained through a programmable, automatic two-point calibration feature. The monitor includes a dry heating block to raise the sample temperature, which is continuously monitored to ensure the integrity of the fluoride measurement. Sample flow and buffer addition is provided with a cartridge-type peristaltic pump.

The AZTEC® F1000 Fluoride Monitors are constructed of low-weight, corrosion resistant materials and are modular in design for serviceability and ease of maintenance. Minimal reagent consumption and user serviceability results in a low cost of ownership for the F1000 Fluoride Monitor. Each unit is pre-piped and pre-wired, requiring only field connection to service points. Visibility of all liquid processing components is provided with tinted window on the front of the analyzer. All controls are accessible from the front of the unit.

Applications

Fluoridation: Monitoring and control of fluoride in drinking water systems.

Effluents: Monitoring of waste streams or metal finishing plants

Cooling Leachate: Monitoring of fluoride leachate into coolants

Food Processing: Monitoring fluoride levels in baby foods

Design Features

- ◆ **Unique sample conditioning system:** The sample stream and electrode are temperature controlled within an efficient, mechanical heat exchanger. Pre-conditioning of the sample with the addition of a total ionization buffer fixes the ionic strength of the sample for stable, accurate fluoride measurement.
- ◆ **Automatic calibration:** Two-point autocalibration with fluoride standard solutions ensures a high degree of accuracy and reproducible results. The calibration can also be manually initiated.
- ◆ **Data logging and trending:** Statistics for up to 28 days; previous 7 days; or previous 24 hours are logged and can be viewed in graphical format
- ◆ **Automatic ranging from 0-100 mg/l:** The monitor provides automatic ranging capabilities from 0-100 mg/l without any hardware or software modifications
- ◆ **Ease of use:** On-screen instruction and self diagnostics provide visual data to efficiently configure, operate, and maintain the monitor. All components are visible behind a tinted window and are easily accessible from the front of the monitor.
- ◆ **Six programmable alarm relays:** Each relay is independently configurable to be high, low, attention, or fail.
- ◆ **NEMA 4X:** The electronics enclosure is NEMA 4X for protection

Principle of Operation

A sample is drawn from the sample chamber by the sample pump. Total ionic strength adjustment buffer (TISAB) is then pumped into the sample line and mixed with the sample to adjust the ionic strength of the solution. The conditioned sample is passed through the coils of the heat exchanger to raise the temperature and provide further mixing.

The heat exchanger consists of a heated aluminum block with tubing wrapped around channels in the block. The ion-selective fluoride electrode is mounted in the heating block to ensure temperature stability.

The conditioned sample is presented to the fluoride electrode. At this point, the output of the electrode is converted, by the microprocessor, to indicate the direct fluoride concentration in ppm, mg/l, ppb, µg/l or in graphical format. Finally, the sample flows to waste.

During calibration, the sample supply is isolated and the calibration standards are presented to the flow cell by sequencing of the electrically- actuated pinch valves. The two standards are measured and compared to the user-configurable standard values. The comparison normalizes the fluoride electrode for sample monitoring. Calibration frequency is user-programmable on a weekly basis or up to four times per day.

Technical Data

Series F1000

SAMPLE

Sample Flow: 200-500 ml/min at 5 psi minimum (10 psi maximum)
Sample Pressure: 5 psig
Sample Temperature: 32°F-120°F (0°C-50°C)
Sample Supply: Continuous
Sample Limitations: Samples containing particles 100 microns (0.004 inches) in diameter and larger may require pre-filtration.
Accuracy: 2% of reading
Conditioned Sample: Temperature operating value 35°C ±0.2°C (96°F ±0.4°F)
Reagent Requirements:
Chemical Reagents:
 Buffering Reagent - total Ionic Strength Adjustment Buffer (TISAB)
 Low fluoride standard solution
 High fluoride standard solution
 Fluoride probe filling solution
Reagent Consumption:
 2.5 liters/week of total ionic strength adjustment buffer (TISAB)
 50 ml/calibration cycle each low and high fluoride standard solutions (1.5 liters/4 weeks at an automatic calibration frequency of once per day)
 50 ml probe filling solution per month

INSTRUMENT

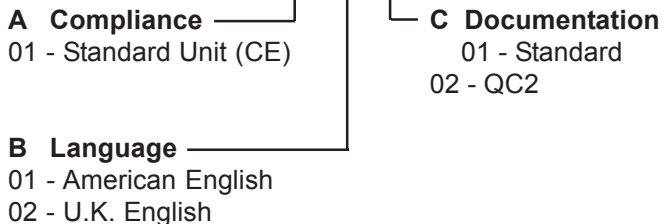
Electronics Enclosure: NEMA 4X industrial ABS enclosure
Sample/Drain connections:
 Inlet: 1/4" (6 mm) O.D. hose connector
 Drain: 3/8" (10 mm) O.D. hose connector
Shipping Weight: 25 lbs (15 kg)
Dimensions: 19 x 26 x 8" (485 x 660 x 205 mm)
Optional Accessories:
 Recorder
 Printer
 Wedge-wire filter

GENERAL

Quality Standards: ISO 9001 Certified
Compliance: CE
Instrument Range: Automatic ranging from 0-100 (mg/l) as F-
Display: 3" x 4", dot-matrix, graphical display
Data Logging: Up to 28 days; previous 7 days; previous 24 hours
Resolution: 0.001 mg/l for below 10 mg/l, 0.01 for 10-99 mg/l, 0.1 for 100 mg/l
Configurable Residual Units: mg/l, ppm, ppb or µg/l
Autocalibration: Two-point, automatic with manual initiation on a weekly basis or up to four times per day
Analyzer Location: As close as possible to sample point
Speed of Response: Ninety (90%) step change within 5 minutes.
Ambient Temperature: 32°F-140°F (0°C-60°C)
Languages: (American) English, U.K. English (for other languages, consult factory)
Power Requirements: Automatic power selection for 85-264 Vac, 47-63 Hz, 1 phase (consult factory for 24 Vdc)
Power Consumption: 75 Watts
Output Signal: Single 4-20 mAdc, 0-20 mAdc, or 0-10 mAdc, isolated into 1000 ohms maximum
Digital Output: RS232/485 communication capabilities
Relay Contacts (Six): Each relay is independently configurable to be high, low, attention, or fail. The fail relay can be set by a hardware jumper to indicate a power failure. There are also settings for hysteresis, delay, and action. Alarm contacts rated 5A @ 240 Vac, resistive load.

Model Information Code

Model F1000.



Warranty and Capability

Capital Controls offers a one (1) year limited warranty on the F1000 Fluoride Monitor.

Capital Controls is ISO 9001 certified to provide quality and precision materials. Disinfection technologies, water quality monitors and instrumentation for water and wastewater are areas of specialization. Over 35 years of industrial and municipal application experience in the water and wastewater industries is incorporated into the equipment design to provide high quality comprehensive solutions for the global market.

Brief Specification

The Fluoride Monitor shall provide continuous on-line measurement of fluoride levels in a sample using an ion-selective fluoride electrode. The monitor shall provide automatic ranging for 0-100 mg/l of fluoride in water, within 2% of the reading. The microprocessor-based analyzer shall display the residual in mg/l, ppm, ppb, or μ g/l.

The monitor shall be a microprocessor-based instrument with a 3" x 4" dot-matrix graphical display housed in a NEMA 4X electronics enclosure. The monitor shall provide data logging and trending for up to 28 days; previous 7 days; or previous 24 hours. Display resolution shall be 0.001 mg/l for below 10 mg/l, 0.001 for 10-99 mg/l, 0.1 for 100 mg/l.

The sample conditioning within the monitor shall include the addition of a total ionic strength adjustment buffer (TISAB) into the sample line. The conditioned sample shall be raised to a temperature of $95^{\circ}\text{F} \pm 0.4^{\circ}\text{F}$ ($35^{\circ}\text{C} \pm 0.2^{\circ}\text{C}$) by a flexible tubing loop within an aluminum block. The fluoride probe shall be mounted in the heating block and shall be raised to the same temperature as the sample.

The sample, reagents, and standard solutions shall be moved through the monitor with a cartridge-type, four-roller peristaltic pump.

The monitor shall feature two-point, programmable automatic calibration with separate high and low fluoride standard solutions on a weekly basis or up to four times per day.

The monitor shall provide on-screen instruction and self diagnostics. All user controls shall be provided through four membrane buttons on the display face.

The monitor shall include six (6) adjustable alarm relays that are independently configurable to be high, low, attention, or fail. The monitor shall include settings for hysteresis, delay, and action. Alarm contacts shall be rated 5A @ 240 Vac, resistive load.

The monitor shall have universal power recognition from 85-264 Vac, 47-63 Hz, 1 phase power.

The monitor shall provide an isolated 4-20 mAdc, 0-20 mAdc, or 0-10 mAdc into a maximum of 1000 ohms. The monitor shall have RS232/485 communication capabilities.

The monitor shall be Capital Controls AZTEC Series F1000 Fluoride Monitor.

Design improvements may be made without notice.

Represented by:



CAPITAL CONTROLS

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