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measurement instruments

PRODUCT DATASHEET

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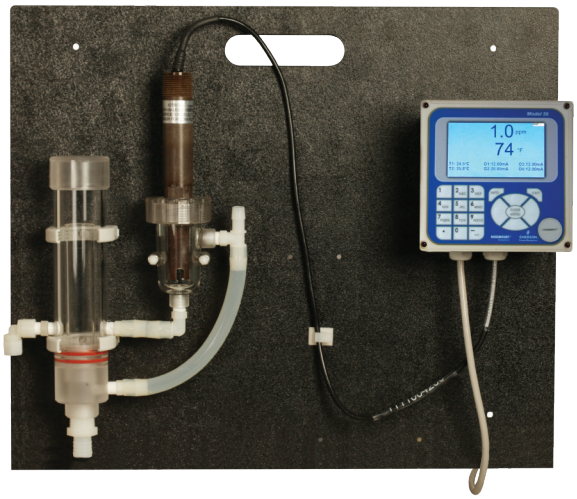
Fluoride Monitoring System

- Complete system includes sensor connecting cable, transmitter, and flow controller.
- No need for reagents or troublesome sample conditioning systems.
- Measures free Fluoride in samples having pH as high as 9.5[1]. Free chlorine measurement optional.
- Includes a feature packed Rosemount 56 Transmitter
- Low Flow system provides stable measurements with minimal waste.



Applications

The Fluoride Monitoring System is ideal for measuring free Fluoride in fresh water and in municipal drinking water plants. Unlike Fluoride analyzers from other manufacturers, the SQP10102 does not use expensive sample conditioning systems or messy reagents.

Features

The Fluoride Monitoring System is an all inclusive system requiring no reagents, or mechanical devices for operation. The fluoride sensor is an ion selective sensor with a monocrystal sensing element with a virtually maintenance free solid state reference system. The chlorine sensor (if required) uses a membrane covered amperometric sensor.

The Fluoride Monitoring System is available in two options: SQP10102-LQD: A single channel system for monitoring free fluoride only and SQP10103-LQD for monitoring Fluoride and Free Chlorine. Other options are available (consult factory).

Maintenance is fast and easy. Valves, rotameters, and pressure regulators to control sample flow are things of the past with the Fluoride monitoring system. A constant head overflow sampler ensures the correct sample flow to the sensors. The Fluoride sensor is maintenance friendly requiring only periodic calibration and cleaning. Replacing a membrane on the chlorine sensor requires no special tools or fixtures and replacing the electrolyte solution takes only minutes.

Specifications – General

Sample Requirements:

Pressure: 3 to 65 psig (122 to 549 kPa abs). A check valve in the inlet prevents the sensor flow cells from going dry if sample flow is lost. The check valve opens at 3 psig (122 kPa abs). If the check valve is removed, minimum pressure is 1 psig (108 kPa abs).

Temperature: 42 to 122 °F (5 to 50 °C)

Minimum Flow: 3 gal/hr (11L/h)

Maximum Flow: 80 gal/hr (303 L/hr); high flow causes the overflow tube to back up.

Sample Conductivity: >50µS/cm at 25 °C

Process Connection: ¼-in OD tubing compression fitting (can be removed and replaced with a barbed fitting for use with soft tubing).

Drain connection: ¾-in barbed fitting. Sample must drain to open atmosphere.

Wetted parts:

Overflow sample and flow cell: acrylic, polycarbonate, polyester, Kynar®, nylon, silicone

(1) Requires stable pH (pH does not change more than 0.2 units). For applications requiring pH correction consult the factory.

Fluoride sensor: Ultem®, Ryton®, and HDPE
Response time to step change in chlorine concentration: <80 sec to 95% of final reading for inlet sample flow of 3 gph (11 L/hr).
Weight/shipping weight:
FMS: 10 lb/13 lb (4.5 kg/6.0 kg)
[rounded to the nearest 1 lb. (0.5 kg)]

Specifications – Fluoride Sensor

Free Fluoride range: 0 to 10 ppm Fluoride (additional ranges available, consult factory).
Accuracy: Accuracy depends on the accuracy of the chemical test used to calibrate the sensor.
Configuration: ¾"–1" MNPT Immersion Fluoride Ion Sensor for use in High pH Application
Lowest Limit of Detection: 5X105 Molar, .001 ppm
pH Range: 5.5 – 9.5 pH (continuous)
Temperature Range: 5 to 50 °C
Pressure Range: 1 to 20 psig (6.9 to 138 kPag)
Body Material: Ultem (Poly-Ether-Imide) and Ryton
Junction Material: HDPE
Measuring Membrane: Selective Fluoride Sensitive Membrane (solid state)
Special Features: Cross linked polymer in the reference system is resistant to heat, solvents and to most chemicals. Sensor holds an excess of KCI, assuring saturation at all temperatures and extending the life of the sensor.
Storage and Shelf Life: At room temperature with closed protector cap, 1 year from date of manufacture.

Specifications for Rosemount 56 Transmitter

Case: Polycarbonate
Display: Full color LCD, 3.75 x 2.20 in. (95 x 56 mm); display can be customized by the user.
Languages: English, French, German, Italian, Spanish, Portuguese, Chinese, Russian, and Polish.
Ambient Temperature and Humidity: 14 to 140 °F (-10 to 60 °C); RH 5 to 95 % (non-condensing). Between 23 and 131 °F (-5 to 55 °C) there is no visible degradation in display response or performance.
Storage temperature: -4 to 140 °F (-20 to 60 °C)
Power: 85 to 265V AC, 47.5 to 65.0 Hz, 20 W
RFI/EMI: EN-61326
LVD: EN-6101-01 CE

Outputs: Four 4–20 or 0–20 mA isolated current outputs; assignable to measurement or temperature; fully scalable; maximum load 550 Ω. HART digital signal is superimposed on output 1.
Alarms and Timers: Four relays, fully configurable as a setpoint alarm, interval timer, TPC, bleed and feed timer, delay timer, date and time timer, and fault alarm.
Relays: Form C, SPDT, epoxy sealed.
Relay Contact ratings:
5 A at 28 VDC or 300V AC (resistive)
⅛ HP at 120/240V AC
Control features: PID control (analog output) and time proportional control or TPC (relays) are standard.
Data logger: Data automatically stored every 30 seconds for 30 days; older data removed to make room for new data. The following data are automatically stored:
Chlorine: date and time, ppm, temperature, raw sensor current.
pH: date and time, pH, temperature, mV, glass impedance, and reference impedance (if available)
Event logger: Stores up to 300 events with data and time stamp: faults, warnings, calibration data, calibration results (pass or fail), power on/off cycles, and hold on/off. Alarm relay activation and deactivation can also be stored. Older events are automatically removed to make room for new events. Data and event downloading: through USB port on front panel.
Graphic display: Dual graphical display shows measurement data on the y-axis and time on the x-axis. Y-axis is fully assignable and scalable. X-axis can be set to one hour, one day, seven days, or 30 days.
Digital communications: HART digital communications is standard.
Hazardous Location Approvals: For more information refer to the Rosemount 56 product data sheet 71-56. Approvals apply to the transmitteronly. The greater system is not suitable for use in hazardous areas.

Engineering Specification

1. The system shall be suitable for the determination of fluoride in water having conductivity greater than about 50 uS/cm at 25 °C .
2. The system shall consist of a transmitter, a Fluoride sensor, Chlorine sensor (if required), flow cells for each sensor, and a flow controller. The components shall be mounted on a back plate. Sensor cables shall be pre-wired to the transmitter. The sensor flow cells shall be clear plastic to allow the sensors to be easily inspected for fouling. The inlet shall be fitted with a check valve to ensure the sensors remain wet in the event sample flow is lost.
3. The system shall use no mechanical devices, such as pressure regulators, valves, or rotameters, to control flow. Instead, flow shall be regulated using a constant head flow controller. Minimum sample flow shall be no less than 3 gallons per hour (11 liters per hour). Maximum flow can be as high as 80 gallons per hour (303 liters per hour). The flow controller shall be able to handle inlet pressure between 3 and 65 psig (122 to 549 kPa abs) and temperature between 41 and 122 °F (5 and 50 °C).
4. The fluoride sensor shall be a combination ion selective electrode. The fluoride sensor shall be fitted with an RTD to allow continuous correction for changes in temperature.
5. The chlorine sensor shall be a reagentless amperometric electrode.

   The Rosemount 499ACL Chlorine Sensor uses a membrane-covered amperometric sensor. All amperometric free chlorine sensors respond to changes in pH. Although free chlorine is a mixture of hypochlorous acid and hypochlorite ion, hypochlorous acid alone is responsible for the sensor current.
6. The transmitter shall have dual input, one for the fluoride sensor and the other for the chlorine sensor (if needed).
7. The transmitter shall be capable of one or two-point calibration. The transmitter shall be capable of performing a process standardization calibration to allow for agreement between the laboratory and field analysis.
8. The transmitter shall have a four line, back lit display. The display shall show ppm fluoride, pH (if required), and temperature on one screen. The display shall be programmable to show additional information such as raw sensor current.
9. The analyzer shall be capable of operating between 32 and 131 °F (0 and 55 °C) and between 5 and 95% relative humidity (non-condensing).
10. The transmitter shall have four 4–20 mA isolated outputs and HART digital communications. Profibus shall be optional. Outputs shall be fully scalable and assignable independently to fluoride, pH, or temperature. PID control shall be available as a standard feature.
11. The transmitter shall have four alarm relays fully programmable for logic (high or low operation), dead band, and setpoint or as a timer Timer functions shall include an interval timer, bleed and feed timer, delay timer, and date and time timer. Time proportional control shall also be available. Relays shall also be configurable to energize when the analyzer detects a fault with the sensor or itself.
12. All transmitters programming shall be through a front panel membrane keypad. The language (English, Spanish, Italian, Portuguese, German, French, or Chinese) used in the menu screens shall be selectable by the user.
13. The transmitter shall have a data logger that automatically stores data every thirty seconds for thirty days with older data being discarded to make room for newer data. In addition to storing date and time, Fluoride concentration, pH, and temperature, the analyzer will store raw sensor mV reading (fluoride and pH) and glass and reference impedance (pH sensor). Stored data shall be downloadable through a USB port.
14. The transmitter shall have a dual graphical display that allows stored data to be viewed over one hour, one day, seven days, and one month intervals.
15. The transmitter shall have a data logger that stores up to 300 events.
16. The transmitter shall have help screens, available at the touch of a button, that provide information about configuration, calibration, and troubleshooting.
17. The transmitter shall have a security feature to prevent unauthorized tampering with calibration and configuration settings.
18. The system shall be Rosemount SQP10102-LQD (single channel Fluoride) or SQP10103-LQD (dual channel Fluoride / chlorine).

Ordering Information

Sample handling system includes: constant head flow control, low flow cell with bubble shedding nozzle, vented ¾" adaptor (fluoride), and 1" adaptor (chlorine) and all necessary tubing and fittings. All components shown below are mounted and wired on back-plate ready for use		
SINGLE CHANNEL FLUORIDE MONITORING SYSTEM		
SQP10102-LQD		
QTY. 1	56-03-22-38-HT	Rosemount 56 Transmitter - Single Channel (sold seperately)
QTY. 1	S10258	Fluoride Sensor with integral cable (sold seperately)
DUAL CHANNEL FLUORIDE AND FREE CHLORINE MONITORING SYSTEM		
SQP10103-LQD		
QTY. 1	56-03-22-34-HT	Rosemount 56 Transmitter - Dual Channel (sold seperately)
QTY. 1	S10258	Fluoride Sensor with integral cable (sold seperately)
QTY. 1	499ACL-01-54-VP	Rosemount 499ACL Free Chlorine Sensor with Variopol Cable Connection (sold seperately)
QTY. 1	23747-04	4 ft. VP6 Cable for Chlorine Sensor (sold seperately)

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