Data Sheet FX-300-F/AS
Acid Service ISE Fluoride Monitor

The Model FX-300-F-AS fluoride ion analyzer monitors fluoride ion activity in severe environments including acidic wastewater produced by semiconductor etching, as well as industrial processes such as stainless steel pickling baths.

The transmitters feature ease of use with simple 3 button operation and include the essential functions needed for process monitoring and control. With our industrial duty reagentless ion selective electrode sensors, the FX-300-F/AS provides a simpler, less costly method of online monitoring compared to sample conditioning analyzers.

Modular electronics allow you to purchase only the functions you need or to combine other parameters such as ammonium, conductivity and pH into one enclosure. Complimentary modules can be added at any time after installation.

Sensors are application engineered to operate continuously in 0-6pH solutions and to withstand acid cleaning of calcium fluoride and fluorosilicate deposits in higher pH solutions.

Valve retractable sensor holders are available for insertion depths up to 41" in process tanks.

Inline installations require a minimum 4" pipe process line size, and are available with retractable extension tube inline sensor mounting shown below.

Submersible sensors are available with optional chemical resistant cable sealing. The required offset calibration to a photometric or colorimetric result can be performed without removing the sensor from service.

Valve Retractable Sensor Mounting

Inline Retractable Compression Fitting Mtg. (shown without pipe nipple over sensor)

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SPECIFICATIONS: FX-300-F/AS Fluoride Ion Analyzer With Model SFL Sensor

Measurement Type and Purpose:	Ion Selective Electrode (ISE) to monitor fluoride ion activity in process control of acid etching & other wastewater treatment
Application Range Model SFL Sensor	Fluoride ion 1 to 10^{-6} Molar, 19,000 to 0.019 ppm
Displayed Concentration Range:	999 to 0.02 ppm; Lowest displayed limit of detection: 0.01 ppm
	Output Range Full Scale: High 0-999 ppm, Mid 0-100.0 ppm, Low 0-10.00 ppm).
Lowest Limit of Detection:	$5X10^{-8}$ Molar, 0.001 ppm
Sample pH Range:	0-6 pH continuous
Sample Temperature Range:	5 to 70°C;
Pressure Range:	1- 20 psig
Sample Flow Requirements:	Slow continuous flow, 1 foot per second max., 10 PSIG max.
Conductivity Range:	>150µS/cm
Temperature Compensation:	Automatic or manual (fixed), PT100 / PT1000
Ion Sensor Specifications:	Combination sensor, solid state selective fluoride sensitive membrane, designed to resist the attack of acids.
Sensor Body & Mounting:	Ultem™ (Poly-Ether-Imide). Submersible. Retractable installation up to 41" deep. Minimum 4" pipe for inline mounting.
Reference Type:	Double junction
Reference Half Cell:	Ag/AgCl, Saturated KCl, in excess to assure saturation at all temperatures & extend sensor life
Reference System: Primary Junction:	Porous Ceramic, Saturated KCl in cross linked polymer, resistant to heat, solvents, most chemicals
Secondary Junction:	Porous Kynar, Saturated KCl salt system in cross linked polymer, resistant to heat, solvents & most chemicals
Transmitter & Display:	ISE input < 1pA, >10GΩ, Accuracy +/- 0.2%, 24VDC +/- 10V, consumption 60mA max. CE mark EN61326A; Dims. 2.3" D x 1.4" W x 3.4" H. 3-digit red LED display of ion activity in ppm or temperature.
Power Supply:	CSA/UL/CE approved universal 115/230 VAC power supply or 3-wire 24VDC with dedicated power supply
Signal Output:	Selectable 0/4-20 mA DC 250 Ω max galvanically isolated, scalable down to 20% of range. RS-485 Modbus digital output available optionally
Instrument Mounting & Dimensions:	Wall Mount, NEMA 4X lockable enclosure, 7.2" high x 7.2" wide x 6" deep (plus mounting tabs) standard enclosure. 9" x 11" enclosure for 5 or more modules in one unit. 2" pipe mount available.

Module Description & Options:

Transmitter Modules: All analog outputs have built-in trim calibration support, including both offset and span adjustments. Galvanic isolation between sensor input, power & analog output (3000V rating). 4-20mA can support remote external secondary displays. 35mm Din rail mounting. Calibration of temperature element is available for all measurement modules. Temperature output transmission requires separate module or Modbus output.

Preamplifier Support: Unlike many low cost systems, the FX-300 series supports optional external preamplifiers for electrically noisy environments. Permanent wiring from preamplifier to monitor allows the use of short sensor cables to minimize sensor replacement cost, and avoids the need to open the monitor enclosure for sensor service.

FX-REL Option: Alarm relay and controller module provides (2) each 5 Amp dry contact relays and (2) independent limits. (1) required for each measurement module. Controller fully configurable for control mode and variables for each control algorithm. Control modes include: 1) Alarm functions only; 2) On/Off control with a user-configurable dead band; 3) Time proportional control; 4) Proportional frequency control (variable pulse controller). Hold function to disable relays during calibration. Includes start timer to avoid alarms during startup and reaction timers for each limit to avoid alarming if limits are momentarily exceeded.

Data Logging Option: Removable USB data logger records up to 32,000 readings over a 4-20mA DC range or by separate FX-300-DAT data logging module with onboard 8MB serial flash memory and data download via RS232 or USB with included Windows software

FX-TOT Option: pH compensation module computes total fluoride (Fluoride + HF) in fluids 5.5pH or less, using the free ion activity, pH, and temperature from the respective measurement modules' bridged outputs. Includes a scalable 4-20mA output for total result and RS485 Modbus communications for all inputs and outputs. By using the bridged output for totalizing, you retain the use of pH, ion, and temperature outputs. THIS MODULE IS REQUIRED IN FLUIDS WITH 5.5 pH or less.

Modbus Option: Available by ordering the measurement module to include RS485 Modbus (only on initial order), or by adding the separate FX-TOT module