

## Series Q46F Dissolved Fluoride Monitor

Dissolved Fluoride Monitors shall be supplied for continuous measurement of the dissolved fluoride at the       (Specify Location)      . The fluoride monitoring system shall consist of an electronic monitor, a chemistry module containing a fluoride sensor with integral reference element, pumps and associated accessories as listed below. The dissolved fluoride monitoring system shall be ATI Model Q46F or equal.

The chemistry module shall be housed in a separate enclosure with clear cover and containing an ion selective fluoride electrode with integral silver/silver chloride reference element, sample and buffer pump and cast acrylic measuring chamber. The fluoride electrode shall be connected to a preamplifier module to provide the monitor with a low impedance signal. Distance between monitor and chemistry module shall be up to 300 feet.

The sample shall be drawn from a sample overflow chamber at a fixed rate of 15 cc/minute with overflow discharged to a drain line.

The system shall perform an automatic calibration routine to correct for sensor zero drift and span. The frequency of this automatic calibration shall be user-selectable from 24 to 999 hours.

The system shall have an air purge feature that automatically removes any air accumulation that may occur at the face of the fluoride sensor. The frequency of this air purge shall be user programmable.

Monitors shall be powered by 90-260 VAC single-phase line power. The monitor shall provide two isolated 4-20 mA outputs as standard, with an option for a third 4-20 mA output. Outputs shall be configurable for fluoride concentration, temperature, or PID control. Analog outputs shall be both ground isolated and isolated from each other. The chemistry module shall be powered by either 115 VAC or 230 VAC.

For alarm purposes, monitors shall contain three SPDT relays. Relay functions shall be programmable for control, alarm, or fail functions, and may be designed for either normal or failsafe operation. For monitors supplied with only 2 analog outputs, monitors shall have the option of an additional 3 low-power relays to allow for additional external alarm functions.

The dissolved fluoride monitor electronic assembly shall provide a variety of functions as follows.

1. Provide user selectable display of PPM dissolved fluoride, process temperature, or PID % output on the main display. Main display variable shall be indicated with a minimum character height of 0.75" to allow easy readability up to 20 feet away.
  2. Allow selection of operating ranges of 0-20, 0-200, or 0-2000 PPM. Display ranges shall be configurable by operators, or the monitor may be configured for Auto-Ranging. The auto-ranging function shall automatically switch to the display range that provides the best resolution for any given operating level.
  3. Provide the ability to use the 4-20 mA output for PID control. Proportional, Integral, and Derivative functions shall be user adjustable, and also provide for output hold when needed.
  4. Provide two isolated 4-20 mA outputs, with output spans programmable by the user for any segment of a display range.
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5. Provide output hold and output simulate functions to allow for testing or remote receiving devices or to allow maintenance without disturbing control systems.
6. Provide three 6 amp SPDT relay outputs in standard unit. Software settings for relay control include setpoint, deadband, phase, delay, and failsafe. Provide an optional 3-relay card, for 0-30 V signals, to bring the total to 6 relays. Relays shall be programmable for either control or alarm function, or relays may be assigned to diagnostic functions for use in indicating trouble conditions at a remote location.
7. Provide option for digital communications. These options shall include Profibus-DP, Modbus-RTU, or Ethernet-IP.
8. Diagnostic functions shall be incorporated into the transmitter. The 4-20 mA output shall be capable of being assigned to safely rise to 20 mA, fall to 4 mA, or be left alone, during diagnostic failures. Diagnostic error messages shall be displayed in clear language; no confusing error codes shall be displayed.

The complete Dissolved Fluoride Monitor shall be Series Q46F as manufactured by Analytical Technology, Inc. or approved equal.

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