Series Q46FD Direct 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 fluoride sensor with integral reference element, and a sensor flowcell. The dissolved fluoride monitoring system shall be ATI Model Q46FD or equal.

The system is designed to measure fluoride ion directly without the use of chemical buffers and is suitable for potable water systems with stable pH and conductivity. It is especially useful for applications where the use of chemicals is undesirable. The full scale operating range of the system may be selected by the user for 0-20.00 PPM, 0-200.0 PPM, or 0-2000 PPM. The analog output signal may be spanned for smaller ranges within the overall operating ranges. Because water is flowing through the flowcell at a low rate, this unit cannot be exposed to temperatures below 0°C.

The basic sensing element used in the monitor is a fluoride ion selective electrode (ISE). This sensor contains a lanthanum fluoride crystal that generates a voltage proportional to the activity of fluoride ion in solution. A silver/silver chloride reference electrode contained in the same sensor body provides the second half of the measurement cell. Because ISE electrodes respond to activity rather than concentration, the response is slightly affected by changes in sample pH and conductivity, but these effects are quite small on samples from relatively stable water sources such as well water.

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.

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 Q46FD as manufactured by Analytical Technology, Inc. or approved equal.