

Turbidity Monitoring System - IR Light Sensor

____ (Quantity) ____ Turbidity Monitors shall be supplied for continuous monitoring of turbidity in ____ (Specify Application and Location) ____ . The turbidity monitoring system shall consist of an electronic monitor, sensor and accessories listed below. The Turbidity Monitoring System shall be ATI Series Q46/76 as described below.

Turbidity Sensor

The turbidity sensor shall employ a bright LED light source producing an infrared light beam, and located behind an optical lens focused into the process at a 45° angle with a photo receiver also focused at 45°. The light is then scattered at a 90° angle by the particles. Sensors shall be available for direct immersion, in-line flow applications or self-cleaning. Sensor shall be made of Delrin and have clear Acrylic optical windows.

Turbidity Monitor

The Model Q46/76 is a versatile on-line monitoring system designed for the continuous measurement of turbidity in water. It is intended for continuous monitoring of potable water filter outlets, for raw water inlets, or for turbidity monitoring of wastewater effluent.

The full scale operating range of the system 0-400 NTU. Actual display range is user programmable for 0-2, 0-20, 0-200 or 0-400 NTU, and the system can also be programmed to display in units of PSL for applications where polystyrene latex spheres are the standard of measurement.

Q46/76 Monitors are available in two electronic versions, an AC powered monitor with integral alarm relays and dual 4-20 mA output capability, and a 12-24 VDC unit with dual output and relays.

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 turbidity monitor electronic assembly shall provide a variety of functions as follows.

1. Provide user selectable display turbidity in NTU's (Nephelometric Turbidity Units) in a range up to 400, 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 0-2.000, 0-20.00, 0-200.0 or 0-400.0 PPM. Display ranges shall be configurable by operators.
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3. The monitor shall provide sensor diagnostic functions to warn of conditions that cause inaccurate or invalid readings and to continuously monitor for optical fouling of the sensor, displaying an alarm message when the sensor requires cleaning.
4. 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.
5. Provide two isolated 4-20 mA outputs, with output spans programmable by the user for any segment of a display range.
6. Provide output hold and output simulate functions to allow for testing or remote receiving devices or to allow maintenance without disturbing control systems.
7. 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.
8. Provide option for digital communications. These options shall include Profibus-DP, Modbus-RTU, or Ethernet-IP.
9. 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.

AUTO-CLEAN OPTION: The Q-Blast Auto-Clean assembly is housed in a NEMA 4X enclosure suitable for indoor or outdoor use. The system includes an integral compressor and air-pulse control components, with a power supply for the entire air supply system incorporated into the design.

A simple connection to the Q46D monitor provides the sequencing for the system and allows the operator to select cleaning frequencies as often as once every hour to as little as once every 999 hours. To ensure performance in extreme cold conditions, a thermostatically controlled heater is included in the assembly, allowing operation down to -40°C. Systems that do not include an air accumulator to insure adequate pressure bursts are not considered "equal" to the specified unit. The cleaning function shall operate automatically at the interval determined by the operator.

In addition, the cleaner may be energized at any time using the switches on the front of the monitor. In operation, the cleaner system shall delivery short, high pressure bursts of air directly across the face of the sensor. The number of air bursts during any one cleaning cycle shall be programmable by the operator to adjust for particular plant conditions.

The complete Turbidity Monitor shall be Series Q46/76 as manufactured by Analytical Technology, Inc. or approved equal.
