SEVERN TRENT SERVICES

CAPITAL CONTROLS

AZTEC®
Manganese Monitor

The Capital Controls AZTEC® Manganese Monitor, Model M100 is a reliable, continuous on-line process instrument. The microprocessor- based technology makes the operation easy and user-friendly.

The measurement is based on the recognized and approved formaldoxime method. An adaptation of this method is also described in the U.K. Department of Environments “Blue Book Procedures”.

Accuracy and reproducibility are obtained through a programmable automatic calibration feature. This two-point calibration, based on deionized water and a standard solution, represents the only tuning needed for continuous operation.

The sample head combines a precision-engineered pump with the optical measuring cell. The optical cell is self-cleaning further ensuring an accurate and reproducible system.

Sample flow and reagents are monitored by level detectors and the monitor is designed to operate for a minimum of 20 days before reagent replacement.

The M100 is designed to NEMA 4 standards and uses corrosion-resistant materials.

The microprocessor provides between one and six weeks of data logging. Standard outputs include RS232, 4-20 mAdc, parallel printer port, and alarm relays.

- Continuous on-line monitoring
- Two-point auto-calibration
- Self-diagnostics
- Self-cleaning optics
- Multiple sample streams
- Microprocessor controlled
- Data logging
- Rugged industrial design
- Programmable sample frequency

Applications

- **Drinking Water:** Raw and finished water monitoring and control
- **Surface Water:** Monitor for manganese control
- **Disinfection Control:** Monitor and control of potassium permanganate when used as a disinfectant
- **Zebra Mussel Control:** Monitor and control of potassium permanganate when used to control Zebra Mussels

Design Features

- Automatic Calibration: A two-point calibration using deionized water and a manganese standard ensures highly accurate and reproducible results
- Communications: Serial (RS232) and parallel (centronics printer port) and 4-20 mAdc outputs are standard
- Self-diagnostics: The monitor will indicate system faults and shut down in the event of a power or sample flow failure. The unit will automatically restart once these are restored.
- Microprocessor controlled: Installation and operation is user-friendly with control variables such as date, time, alarm limits, calibration interval and print mode that can be entered via the keypad
- Multi-stream: In addition to the standard single stream unit, an optional triple stream unit is available
- Data logging: The microprocessor has a data logging capability with storage in excess of one week of data
- Sample frequency: The number of samples per hour is fully programmable. This reduces maintenance frequency and reagent consumption.

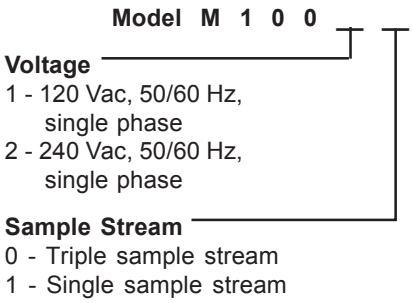
Principle of Operation

The colorimetric method is based upon the reaction of formaldoxime in an alkaline sample. This optical method passes light through a 34 mm sample cell at a wavelength of 450 nm.

A discrete sample of water is collected by the pump at user-programmable intervals. A sample blank is measured to compensate for color or turbidity of the sample and then the sample is transferred to a reaction chamber where alkaline is added. A buffering reagent and color reagent allow a color to develop in direct proportion to the concentration of manganese in the sample. This solution is drawn into the combined pump/optical cell and the transmission of light is measured using a photo-diode detector and a 450 nm optical filter.

The output from the detector is converted by a microprocessor into parts per billion (ppb) $Mn^{2}+$.

In addition, a pre-programmed, two-point automatic calibration ensures the accuracy of this analyzer. The piston pump provides accurate reproducible and a continually cleaned sample cell. (Figure 1)



Technical Data

AZTEC® Manganese Monitor

GENERAL

Measuring Ranges: 20-500 ppb
Accuracy: ±5% at full range
Resolution: 0.01 mg/l
Repeatability: <2% of reading
Sample Flow: 200 to 500 ml/min.
Sample Temperature Range: 1-35°C (33-96°F)
Operating Temperature Range: 0-35°C (32-96°F)
Power: 110 Vac, ±6%, 60 Hz, 120/240 Vac, ±6%, 50/60 Hz. Supply to be stable and generally free of voltage dips/surges, excessive switching spikes and transient noise. 5 Amp fuse.
Power Consumption: 240 watts
Outputs: RS232, parallel (centronics), isolated 4-20 mAdc into 1000 ohms maximum. Each value is held until the reading is updated
Alarms: Monitor requires attention; Monitor failure; Two manganese alarm set points per stream
Alarm Contact Rating:
Single Stream: 4 dry contacts rated 10 amps @ 240 Vac maximum
Triple Stream: 8 dry contacts rated at 10 amps @ 240 Vac maximum
Display: Single line vacuum fluorescent, 5 mm high, 20-character, alpha/numeric reading µg/l Mn
Overall Dimensions: 35 3/8" (899 mm) W x 21 1/2" (545 mm) H x 11 1/4" (285 mm) D
Shipping Weight: 125 lb. (60 kgs)

CHEMICAL

Chemical Reagents:
Alkali reagent
Complexing reagent
Color reagent -formaldoxime
Deionized water
Standard solution
Sample Frequency: 1 to 6 measurements per hour
Sample Flow: 200 to 500 ml/minute
Pressure to Sample Chamber: 7.2 psig (0.5 bar) maximum
Sample Line Velocity: 1 meter per second minimum (recommended)
Sample Temperature Range: 33° to 95°F (1° to 35°C)
Sample Chamber:
Inlet: 1/4" NPT female, fitting 6 mm O.D. tube, quick release
Overflow: 3/8" NPT female, fitting 12 mm O.D. tube, quick release
Cabinet Waste/Drain: 6 mm O.D. tube, quick release
Cabinet: NEMA 4 Three-section industrial, wall cabinet, mild steel construction with phosphate etch prime and epoxy powder texture finish.

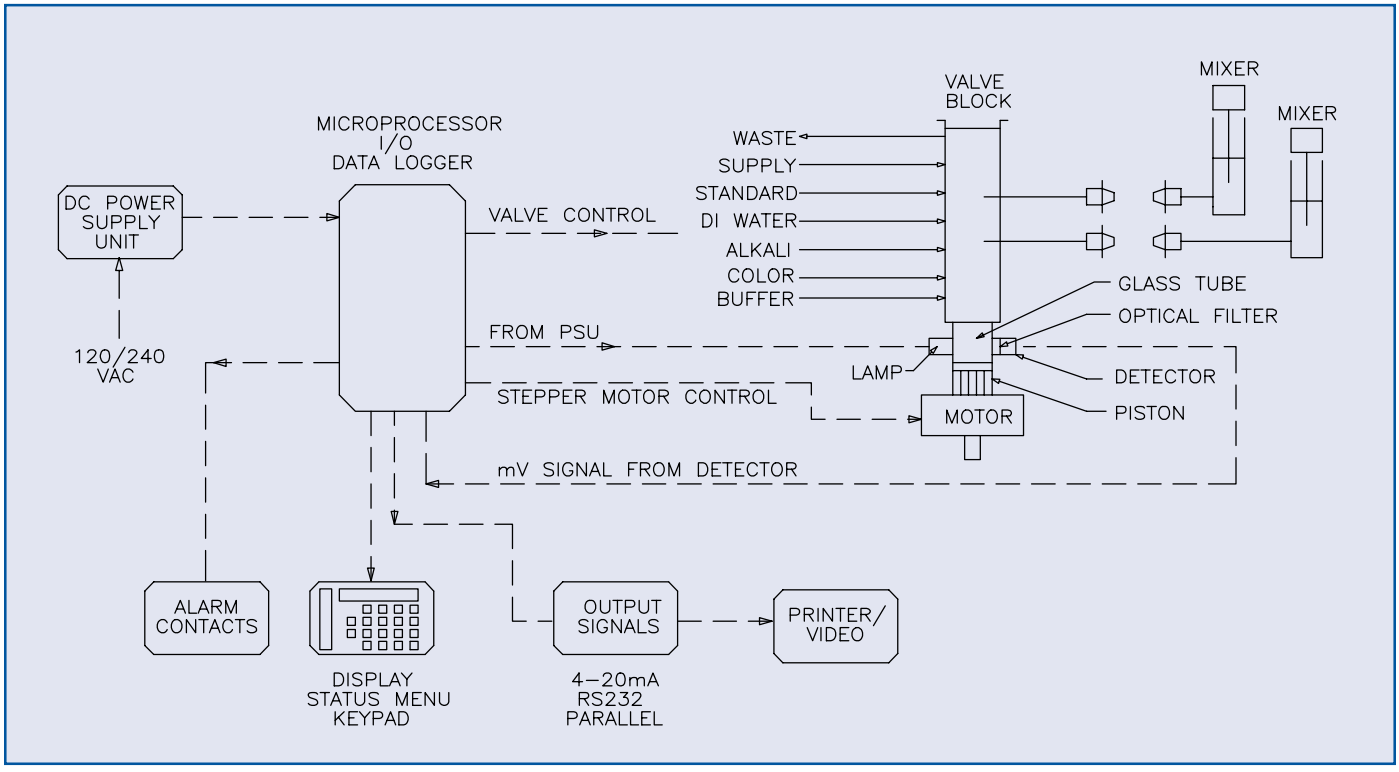


Figure 1 - Manganese Monitor Flow Diagram

Warranty and Capability

Capital Controls offers a one (1) year warranty on all manganese monitors.

Capital Controls is ISO 9001 certified to provide quality and precision materials. Disinfection technologies, water quality monitors and instrumentation are areas of specialization. Over 35 years of industrial and municipal application experience in the water and wastewater industries is incorporated into the equipment design to provide high quality comprehensive solutions for the global market.

Brief Specification

The Manganese Monitor shall provide on-line, continuous analysis of a water sample using the formaldoxime method. The method shall incorporate a blank measurement on the untreated sample. The range of the monitor shall be selectable from 20-500 ppb $Mn^{2.}$

The cabinet shall be constructed of mild steel and be suitably rugged for long term plant operation, water-resistant to NEMA 4 standard. The sensor and electronics shall be mounted within separate compartments to ensure a safe working environment.

Sampling frequencies shall be programmable between 1 and 6 times per hour. Automatic two-point calibrations shall be programmable between 1 and 4 times per day. The unit shall be configurable to a 3-stream unit within the standard enclosure.

The unit shall feature a programmable isolated 4-20 mAdc output, RS232c port, parallel printer port and alarm relay contacts.

The unit shall operate on standard clean power supply within 6% of specification.

The unit shall be Capital Controls AZTEC Manganese Monitor, Series M100.

Design improvements may be made without notice.

Represented by:

SEVERN TRENT SERVICES

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