SEVERN TRENT SERVICES

CAPITAL CONTROLS

AZTEC® Nitrate Monitor Series N1000

The Capital Controls AZTEC® N1000 Nitrate Monitor is a reliable, accurate, on-line process instrument representing the latest technology in continuous nitrate monitoring. The microprocessor-based electronics include on-screen instruction and self diagnostics to make operation easy and user-friendly. The measurement is provided with an ion-selective nitrate sensing electrode based on the nitrate method outlined in the 18th Edition of “Standard Methods”.

The AZTEC® N1000 Nitrate Monitor features a large dot-matrix graphical display with automatic ranging capabilities from 0-1000 mg/l. Display resolution is up to 0.001 mg/l with an optional graphical viewing mode. Six adjustable alarm relays and a 4-20 mAdc output signal are standard. All user controls are provided through four membrane buttons on the display face.

Accuracy and reproducibility are obtained through a programmable, automatic two-point calibration feature. The monitor includes a dry heating block to raise the sample temperature, which is continuously monitored to ensure the integrity of the nitrate measurement. Sample flow and buffer addition is provided with a cartridge-type peristaltic pump.

The AZTEC® N1000 Nitrate Monitors are constructed of low-weight, corrosion resistant materials and are modular in design for serviceability and ease of maintenance. Minimal reagent consumption and user serviceability result in a low cost of ownership for the N1000 Nitrate Monitor. Each unit is pre-piped and pre-wired, requiring only field connection to service points. Visibility of all liquid processing components is provided with a tinted window on the front of the analyzer. All controls are accessible from the front of the unit.

- Ion selective nitrate sensing electrode
- Automatic high and low calibration
- Continuous on-line nitrate monitoring
- Microprocessor-based
- Dot-matrix graphical display
- Automatic ranging to 1000 mg/l
- Data logging and trending
- Separate electronics and liquid processing compartments
- On-screen instruction and self diagnostics
- Six programmable alarm relays
- Regulated sample temperature

Applications

- **Drinking Water**: Finished water monitoring and control.
- **Wastewater:** Effluent compliance and process control
- **Ion Exchange Control:** Blending denitrified water with original water to ensure finished water is below maximum contaminant level (MCL)
- **Surface Water:** Monitor for treatment against algae blooms
- **Food and Beverage:** Control of nitrate in process water
- **Industrial Wastewater:** Effluent compliance

Design Features

- **Unique sample conditioning system:** The sample stream and electrode are temperature controlled within an efficient, mechanical heat exchanger. Preconditioning of the sample with the addition of orthophosphate fixes the ionic strength of the sample for stable, accurate nitrate measurement.
- **Automatic calibration:** Two-point autocalibration with nitrate standard solutions ensures a high degree of accuracy and reproducible results. The calibration can also be manually initiated.
- **Data logging and trending:** Statistics for up to 28 days; previous 7 days; or previous 24 hours are logged and can be viewed in graphical format
- **Automatic ranging from 0-1000 mg/l:** The monitor provides automatic ranging capabilities from 0-1000 mg/l NO_3 without any hardware or software modifications
- **Ease of use:** On-screen instruction and self diagnostics provide visual data to efficiently configure, operate, and maintain the monitor. All components are visible behind a tinted window and are easily accessible from the front of the monitor.
- **Six programmable alarm relays:** Each relay is independently configurable to be high, low, attention, or fail.
- **NEMA 4X:** The electronics enclosure is NEMA 4X for protection

Principle of Operation

A sample is drawn from the sample chamber by the sample pump. Orthophosphate is then pumped into the sample line and mixed with the sample to adjust the ionic strength of the solution. The conditioned sample is passed through the coils of the heat exchanger to raise the temperature and provide further mixing.

The heat exchanger consists of a heated aluminum block with tubing wrapped around channels in the block. The ion-selective nitrate electrode is mounted in the heating block to ensure temperature stability.

The conditioned sample is presented to the nitrate electrode. At this point, the output of the electrode is converted, by the microprocessor, to indicate the direct nitrate concentration as nitrate (NO_3) or nitrate-nitrogen (NO_3-N) in ppm, mg/l, ppb, µg/l or in graphical format. Finally, the sample flows to waste.

During calibration, the sample supply is isolated and the calibration standards are presented to the flow cell by sequencing of the electrically-actuated pinch valves. The two standards are measured and compared to the user-configurable standard values. The comparison normalizes the nitrate electrode for sample monitoring. Calibration frequency is user-programmable on a weekly basis or up to four times per day.

Model Information Code

Model N1000. ___ ___ ___

A Compliance

01 - Standard Unit (CE)

B Language

01 - American English
02 - UK English

C Documentation

00 - Standard
01 - QC2

Technical Data
Series N1000

GENERAL

Quality Standards: ISO 9001 Certified
Compliance: CE
Instrument Range: Automatic ranging from 0-1000 (mg/l) as NO_3
Display: 3" x 4" dot-matrix, graphical display
Data Logging: Up to 28 days; previous 7 days; previous 24 hours
Resolution: 0.001 mg/l for below 10 mg/l, 0.01 for 10 - 99 mg/l, 0.1 for 100-1000 mg/l
Configurable Residual Units: mg/l, ppm, ppb, or µg/l
Analyzer Location: As close as possible to the sample point
Autocalibration: Two-point, automatic, with optional manual initiation on a weekly basis or up to four times per day
Speed of Response: 90% step change within 5 minutes
Ambient Temperature: 32°F-140°F (0°C-60°C)
Languages: (American) English, U.K. English (for other languages, consult factory)
Power Requirements: Automatic power recognition from 85-264 Vac, 47- 63 Hz, 1 phase (consult factory for 24 Vdc optional module)
Power Consumption: 75 Watts
Output Signal: Single 4-20 mAdc, 0-20 mAdc, or 0-10 mAdc isolated into 1000 ohms maximum
Digital Output: RS232/485 communication capabilities
Relay Contacts (Six): Each relay is independently configurable to be high, low, attention, or fail. There are also settings for hysteresis, delay, and action. Alarm contacts rated 5A @ 240 Vac, resistive load.

SAMPLE

Sample Flow: 200-500 ml/min at 5 psi minimum (10 psi maximum)
Sample Pressure: Minimum 5 psig
Sample Temperature: 32°F-120°F (0°-50°C)
Sample Supply: Continuous.
Sample Limitations: Samples containing particles 100 microns (0.004 inches) in diameter and larger may require pre-filtration.
Accuracy: 3% of reading
Conditioned Sample: Temperature operating value 35°C ±0.2°C (96°F ±0.4°F).
Reagent Requirements:

Orthophosphate	Low nitrate standard solution
High nitrate standard solution	Nitrate probe filling solution

Reagent Consumption:
2.5 liters/week of orthophosphate
50 ml/calibration cycle each low and high nitrate standard solutions (1.5 liters/4 weeks at an automatic calibration frequency of 1 per day)
50 ml of probe filling solution per month

INSTRUMENT

Electronics Enclosure: NEMA 4X industrial ABS enclosure
Sample/Drain Connections:
Inlet: 1/4" (6 mm) O.D. hose connector
Drain: 3/8" (10 mm) O.D. hose connector
Shipping Weight: 35 lbs (15 kg)
Dimensions: 19" x 26" x 8" (485 mm x 660 mm x 205 mm)
Warranty: One year
Optional Accessories:
Recorder
Printer
Wedge-wire filter

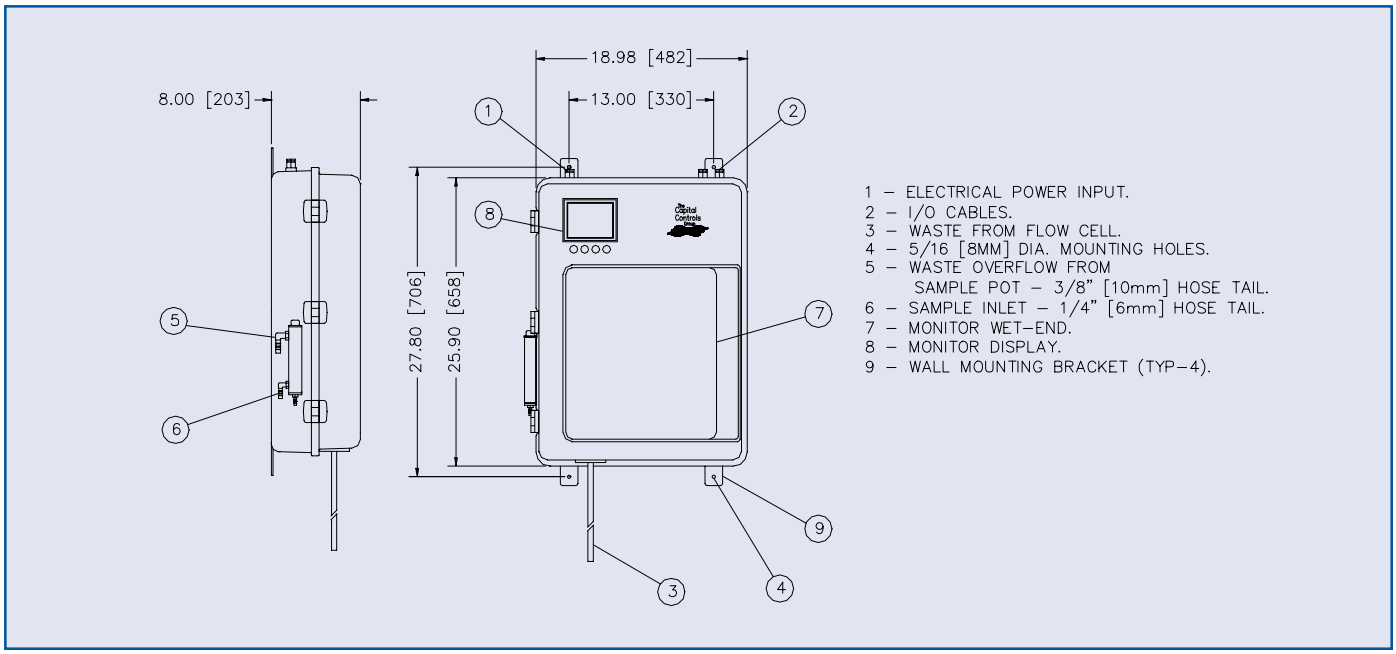

Figure 2 - Dimensions (For reference only)

Warranty and Capability

Capital Controls offers a one (1) year limited warranty on the N1000 Nitrate Monitor.

Capital Controls is ISO 9001 certified to provide quality and precision materials. Disinfection technologies, water quality monitors and instrumentation for water and wastewater 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 Nitrate Monitor shall provide continuous on-line measurement of (Nitrate NO_3) (nitrate-nitrogen NO_3-N) levels in a sample using an ion-selective nitrate electrode. The monitor shall provide automatic ranging for 0.1-1000 mg/l of (nitrate NO_3) (nitrate-nitrogen NO_3-N) in water, within 3% of the reading. The microprocessor-based analyzer shall display the residual in mg/l, ppm, ppb, or µg/l.

The monitor shall be a microprocessor-based instrument with a 3" x 4" dot-matrix graphical display housed in a NEMA 4X electronics enclosure. The monitor shall provide data logging and trending for up to 28 days; previous 7 days; or previous 24 hours. Display resolution shall be 0.001 mg/l for residual levels below 10 mg/l, 0.01 mg/l for residual levels from 10-99 mg/l, 0.1 for 100-1000 mg/l.

The sample conditioning within the monitor shall include the addition of orthophosphate into the sample line. The conditioned sample shall be raised to a temperature of 95°F ±0.4°F (35°C ±0.2°C) by a flexible tubing loop within an aluminum block. The nitrate probe shall be mounted in the heating block and shall be raised to the same temperature as the sample. Nitrate probe filling solution shall be maintained in a reservoir and automatically added to the probe on a continuous basis.

The sample, reagents, and standard solutions shall be moved through the monitor with a cartridge-type, four-roller peristaltic pump.

The monitor shall feature two-point, programmable automatic calibration with separate high and low nitrate standard solutions on a weekly basis or up to four times per day.

The monitor shall provide on-screen instruction and self diagnostics. All user controls shall be provided through four membrane buttons on the display face.

The monitor shall include six (6) adjustable alarm relays that are independently configurable to be high, low, attention, or fail. The monitor shall include settings for hysteresis, delay, and action. Alarm contacts shall be rated 5A @ 240 Vac, resistive load.

The monitor shall have universal power recognition from 85-264 Vac, 47-63 Hz, 1 phase power.

The monitor shall provide an isolated 4-20 mAdc, 0-20 mAdc or 0-10 mAdc into a maximum of 1000 ohms. The monitor shall have RS232/485 communication capabilities.

Design improvements may be made without notice.

Represented by:

SEVERN TRENT SERVICES

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