Environmental Analysis

Water quality analysis in environmental applications plays a critical role in the use and management of our natural resources. Whether it be a private or university lab performing a variety of assays for multiple clients, or a municipality performing hundreds of repeated analyses to ensure safety and compliance, rapid and accurate water quality analysis ensures public health and helps to safeguard the environment.

Environmental water quality analysis is performed daily in thousands of laboratories in support of a wide range of industries and critical public services. These assays are generally covered under EPA or other regulations and must use EPA or Standard Methods.

Common scenarios for these instruments include:

- Routine monitoring of public water or waste water systems in municipal labs
- Private laboratories serving industrial or commercial testing needs
- Environmental monitoring of fresh and sea water basins

Common application areas include:

- **Drinking Water** – public drinking water supplies are monitored at multiple sampling sites to ensure quality and health standards are met
- **Waste Water** – public and private waste streams are monitored to ensure that the discharge meets EPA and permit stipulations
- **Seawater** – typical tests include ammonia, nitrate, nitrite, ortho phosphate, total phosphorus, urea, silica
- **Airport Runoff** – typical tests include glycol and other deicing chemicals

In each of the above scenarios, it is critical that the analyses be accurate, repeatable and affordable. For maximum utility, instrumentation should be flexible and easily tasked to perform a wide range of assays on a variety of sample types. Additionally, the analyses are performed by plant operators or technicians tasked with multiple responsibilities, putting ease of use and unattended operation features at a premium.

With these requirements in mind, Unity Scientific has configured two environmental water quality analysis packages in support of private laboratories and critical public services.
Automatic Discrete Analyzer Packages

Unity Scientific has fully automated discrete analyzers that are ideally suited for the demands of municipalities and private labs. Our discrete analyzers combine the latest technologies and innovative designs in cost effective and reliable platforms.

Unity Scientific discrete analyzers feature:

- Discrete sample reaction cells which eliminates cross contamination
- Immediate startup and shutdown to minimize wasted time and waiting for equilibration
- Flexible operation with immediate access to a number of methods without reconfiguration
- Methods programmable per sample to reduce analysis time
- Level sensor to verify sufficient reagent and sample volumes
- Automated preparation and analysis of nitrates using cadmium or enzymatic reduction
- Intuitive operating software with customizable QC limits for reliable results
- Easy Windows based software with intuitive operation, which requires minimal training and expertise
- LIMS compatible exporting which allows for easy data integration
- Reduced reagent consumption, waste production, disposal costs
- Reduced consumables costs for sustainability and control
- Low operating costs

Each analyzer package comes complete with EPA and Standard methods for the following analytes:

- Alkalinity
- Ammonia
- Chloride
- Cyanide
- Hardness
- Nitrate
- Nitrite
- o-Phosphate
- Total Kjeldahl Nitrogen
- Total Phosphorus
- Sulfate

In addition to the methods above, hundreds of methods are available for most common ions, organic acids, minerals, sugars and glycols. Please ask your sales representative for a list of available methods if yours is not listed above.
SMARTCHEM®

The SMARTCHEM is a fully automated, direct read, bench top discrete analyzer designed to maximize productivity for wet chemistry analysis. Municipal and private labs utilize a wide variety of analytical instrumentation in their work and studies. Unity Scientific offers a unique nutrient analyzer, the SMARTCHEM, that can handle all the requirements found in any department. Our systems are easy to operate and can be used by multiple skill levels. The SMARTCHEM stores all methods and start up is as simple as loading samples and reagents, and pressing the start button. The ability to run multiple chemistries from each sample and even running multiple matrices in the same run maximizes efficiency. A key feature of the SMARTCHEM is that it performs “Direct Read” analysis, with each reaction taking place in its own optical grade cuvette. Once the reaction is complete, the carousel automatically moves the cuvette in front of the photometer to be read.

The SMARTCHEM combines the latest technology in discrete analysis with an innovative, unique design that guarantees accurate and reproducible results. The SMARTCHEM is the first discrete analyzer to utilize the Cuvette Quality Assurance System – performing an integrated QC check of each cuvette prior to use. The SMARTCHEM is the only discrete analyzer that has an onboard wash station that automatically cleans each cuvette thoroughly and then verifies that it is ready to be placed back into action. Unlike other systems, this design allows the operator to run more assays per sample without sacrificing the number of samples being analyzed. It also minimizes the cost per analysis since the cuvettes are not discarded after each use as with other discrete analyzers. Compared to systems using disposable cuvettes, the SMARTCHEM saves the user $3,000 - $5,000 per year depending upon the number of samples run each day.

The SMARTCHEM is also the only discrete analyzer to utilize a patented, dedicated sample prep module for the determination of NOx by cadmium reduction. Designed for high-throughput analysis, the NOx module provides automated cadmium regeneration and our new design reduces any chance for exposure to the cadmium as compared to older techniques.

Key Features:
- Unattended high throughput for up to 126 samples
- Analysis of up to 5 analytes per sample at a rate of up to 200 tests / hour
- Best Practice Direct Read Photometry
- Robotic automation designed for unattended & overnight operation
- Auto-dilution with multiple factors for automatic retests of over range samples
- Segregated wastes - better for environment and for reduced hazmat expense
- Self-cleaning operation leaves instrument ready for new samples
- Ability to add samples during operation

SMARTCHEM Package:

Unity Scientific has assembled a complete package designed specifically for water analysis. It provides a superior level of support for both the instrument and continued method development assistance.

The package includes the items listed at the right:

SMARTCHEM 200 Discrete Chemistry Analyzer
- New method development assistance
- Wash and Rinse solutions (Approximately 1 year’s supply)
- Additional consumables for up to 1 year of operation
- Additional nitrate reduction module and sample probe
- On-Site training during installation
- One year warranty
- 1 year standard service contract after Warranty period (includes one preventive maintenance and re-training visit at start of contract period)
- 25% discount on non-consumable parts during standard service contract period
**EASYCHEM**

The EASYCHEM is a compact benchtop automated discrete analyzer that utilizes reaction wells for processing the samples and a flow cell for calorimetric detection of the sample. The EASYCHEM is designed for laboratories with less space or smaller workloads. Like the SMARTCHEM, the EASYCHEM features discrete sample processing for immediate access to multiple assays from the same sample with no cross-contamination issues. The sample reactions are performed in disposable reaction vessels, and each method is stored and immediately accessible in the easy to use Windows based software for maximum efficiency. Up to 18 reagents can be configured in the temperature controlled reagent tray, allowing for many different assays from each sample run. An optional automatic cadmium reduction system makes simple work of nitrate analysis.

The EASYCHEM includes features such as automatic auto-dilution for over range samples and custom QC limits to ensure reliable results. Windows driven EASYCHEM software provides instant results to the operator and can also export data directly to a LIMS. The EASYCHEM is a reliable workstation that provides automated analyses for any laboratory or budget.

**Key Features:**
- High throughput for up to 60 tests unattended, including overnight operation
- 96 low-cost disposable wells for sample reactions
- Analysis of up to 5 analytes per sample at a rate of up to 60-80 tests / hour
- Temperature controlled reagent tray
- Auto-dilution for automatic retests of over range samples
- 10 mm flow cell, with 20 mm and 50 mm pathlengths available
- Unique wash system for sample probe eliminates cross contamination and is ideal for dirty samples

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**EASYCHEM Package:**

Unity Scientific has assembled a complete package designed specifically for water analysis. It provides a superior level of support for both the instrument and continued method development assistance.

The package includes the items listed at the right:

**EASYCHEM Discrete Chemistry Analyzer**
- New method development assistance
- Wash/Rinse solution for 1 year
- Additional lamp assembly
- Additional Cadmium reduction module and probe kit
- On-Site training
- 1 year warranty
- 1 year standard service contract after Warranty period (includes one preventive maintenance and re-training visit at start of contract period)
- 25% discount on non-consumable parts during standard service contract period
### ENVIRONMENTAL ANALYSIS /// WET CHEMISTRY

## Sample Preparation Accessories

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<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<td>SmartDist, Ammonia/Phenol</td>
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<tr>
<td>483-W001-03</td>
<td>SmartDist, Ammonia/Cyanide</td>
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<tr>
<td>114-W000-01/02/03</td>
<td>SmartDigest (250/75/100 mL tubes)</td>
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