AUTOANALYZER 3

MORE THAN 11,000 AUTOANALYZERS SOLD
AutoAnalyzer 3

THE LATEST VERSION OF THE MOST SUCCESSFUL CONTINUOUS-FLOW ANALYZER EVER MADE

AUTOMATED ANALYZER FOR WATER, SOIL, PLANTS, CHEMICALS AND OTHER INDUSTRIAL SAMPLES. MORE THAN 700 APPLICATIONS.

Building on the success of the AutoAnalyzer II and maintaining its reputation for high quality, every part of the AutoAnalyzer 3 incorporates improvements enabled by modern technology to bring higher performance and lower costs to routine analysis. The new modules are compatible with existing AutoAnalyzer systems for easy upgrading.

SEGMENTED FLOW ANALYSIS

The AutoAnalyzer 3 uses all the advantages of air-segmented flow and even reaction times up to 20 minutes and complex procedures like distillation can be automated. Built-in dialyzers eliminate interference from dirty or coloured samples.

The UV digestion procedures conform to the ISO standard methods for automated total cyanide and phosphorus.

ADVANTAGES

- Fully automatic operation
- Ultra-low detection limits
- 40 – 100 samples per hour
- Over 700 applications
- Low reagent consumption
- Compatible with all AutoAnalyzer II systems
- Quick method change-over
- Many officially approved methods
- Wide range: dilution is rarely necessary

2-channel AutoAnalyzer 3 with XY-2 Sampler and multitest manifolds to analyse 18 parameters in water and waste water.
MODULAR DESIGN FOR HIGH FLEXIBILITY

A 1-channel AutoAnalyzer 3 system comprises a sampler, pump, chemical manifold, detector and PC. The system can easily be extended by adding a second chemical manifold and detector:

- the analyzer then becomes a 2-channel system which measures two analytes at the same time. Other modules can be added as required, up to a total of eight channels.

SAMPLERS TO MATCH ALL WORKLOADS

**XY-2 AND XY-3 SAMPLER**

XY-2: High capacity random access sampler for high workloads, accepting many different sizes of sample cups and tubes

- Up to 180 sample cups or tubes in 2 racks.
- Separate rack for standards.
- Any size or shape of sample rack which fits into the sampler can be used.
- Dual-row option
- Software controlled wash pump option
- Cover option
- XY-3 is similar to the XY-2, but with 3 sample racks.

With the dual-probe option, two different preparations of the same sample – e.g. an untreated water sample and the same sample digested for total N and P – can be analyzed at the same time.

**SAMPLER 5**

Economical sampler for smaller workloads

- Takes 40 sample cups up to 5 mL
- Dual-probe option for 40+40 cups
Most AutoAnalyzer II methods show higher performance when run on the AutoAnalyzer 3, thanks to the higher sensitivity, speed and precision of the new system.

- Mixing coils are made of glass, so as to be chemically inert and give a clear view of the flow
- A close-fitting cover reduces the effect of changes in lab temperature
- Liquid drain tube takes spilt fluid out of harm’s way
- New heating bath with high-precision proportional control and replaceable coil improves reproducibility

WIDE RANGE
With the AutoAnalyzer 3 High Resolution (HR) colorimeter, method range is widened in three ways

- The flowcell design extends the linear response at high concentrations
- The high sensitivity detector allows low absorbances to be measured
- The high digital resolution (24 bits) measures very small absorbance changes accurately, even at high full-scale settings.

High reproducibility

Linear range is more than 5 times higher than with a 50 mm flowcell
MULTITEST MANIFOLDS

A MULTITEST MANIFOLD CAN BE USED FOR UP TO 20 DIFFERENT ANALYSES, ONE AFTER THE OTHER. ONLY THE REAGENTS AND THE COLORIMETER WAVELENGTH NEED TO BE CHANGED BETWEEN TESTS.

ADVANTAGES

- Special multitests are available for:
  - water and waste water
  - soil and plant extracts
  - seawater
  - tobacco
  - fertilizer
- Method change-over is easier and quicker than for a system with separate manifolds for each parameter
- Bench space requirement is less than for a multi-channel system
- Maintenance is easier and cheaper
- Purchase cost is lower
- Multitest methods are EPA-approved

DUAL-RANGE METHODS

Most multitest methods are also dual-range – with separate pump tubes for high and low ranges they can cover an extremely wide spread of sample concentrations. For example, the AutoAnalyzer 3 method for nitrate in seawater can measure up to 8500 µg N/L and has a detection limit of 0.14 µg/L. The same manifold can be used to measure ammonia and silicate.

The dialyzer option available on waste water methods eliminates interference from dirty or coloured samples run on the high range.

With the automatic range switching option fitted to the AutoAnalyzer 3 pump, the analyzer can switch from one range to the other automatically.
HIGH PRECISION PUMP

HIGH PRECISION PUMP WITH IDENTICAL FLOW RATES TO AUTOANALYZER II SYSTEMS FOR FULL COMPATIBILITY TO EPA, AOAC AND ISO STANDARD METHODS AND THE LIBRARY OF OVER 700 AUTOANALYZER APPLICATIONS.

- Multi-speed motor with high speed for fast wash-out
- Integrated tray for hydraulic components
- Optional valves for auto-dilution or reagent switching
- Leak detector stops the motor automatically if a spill occurs
- Drain tube takes spilt liquid safely out of the pump
- Control from a PC or on the pump itself

Pump with one set of air valves (left) and one set of dilution valves (right).

AIR VALVES
Electronically controlled air valves provide precise air bubble injection. Each liquid segment has the same volume and contains the same proportion of sample and reagents. This improves reproducibility.

One or two sets of air valves, each with space for 4 air lines, can be fitted to the pump. An external air supply or a single pump tube can be used to feed the air lines, saving pump space.

DILUTION VALVES
With the optional dilution valves, auto-dilution can be added to many existing methods and dual-range multiest methods can change range automatically, so that off-scale samples are re-run at a higher dilution.

Alternatively, the valves can be used to switch between reagents and wash, providing automatic start-up and shut-down.

AUTOANALYZER 3 – OFFICIALLY APPROVED METHODS

AOAC
- Protein (as TKN) in animal feed digests
- Phosphorous in fertilizer
- Fluoride in plant extracts
- Potassium in fertilizer
- Vitamin B2 in food extracts
- Vitamin B3 in food extracts
- Vitamin C in food extracts

ISO (SOME PENDING)
- Nitrate
- Nitrite
- Ammonia
- Phosphate
- Total P with UV digestion
- Total cyanide with UV digestion
- Chloride
- Phenol
- Silicate
- MBAS
- Chromium

EPA
- Alkalinity
- Ammonia
- Chloride
- Nitrate
- Nitrite
- Total N
- Total P
- Phenol
- Phosphate
- Silicate
- Total cyanide with UV digestion and distillation
COLORIMETER

HIGH SENSITIVITY DIGITAL SPECTROPHOTOMETER WITH FULL SOFTWARE CONTROL FOR ALL FUNCTIONS.

High resolution increases the working range for all methods. Bubble-through-the-flowcell operation increases sampling rate. The linear range is extended by a factor of 1.5 for most methods by the flowcell design, with planar end faces and fibre-optic coupling to ensure parallel light transmission through the sample. Dual-beam operation with same-wavelength compensation gives low drift, even at very high sensitivities.

The colorimeter’s high sensitivity results in low detection limits, for example 0.12 µg/L for phosphate in seawater.

Other detectors such as a flame photometer and UV spectrophotometer are available for special applications.

FLOWCELLS

A wide range of flowcells is available, with different lengths and internal volumes to provide an ideal match to every method and to allow bubble-through operation even at low flow rates.

A special 500 mm flowcell, with debubbler, is also available to enhance the peak height at nanogram concentrations.

HIGH PERFORMANCE LED LIGHT SOURCES

The LED photometer or AA3 have a exceptional stability and long life. Being immune to vibration they are ideal for use on ships.

BLANK CORRECTION

With a second flowcell fitted in the reference channel, true real-time blanking is automated.
### SPECIFICATIONS

#### SAMPLERS

| No. of samples | 40 |
| No of samples, dual-row mode | 40+40 |
| No. of standards | 0 |
| Sample cup volume | 0.5, 2, 4 or 5 mL |
| Sample tube diameter | – |
| Sample tube height | – |

#### XY-2 / XY-3 SAMPLER

| XY-2: up to 180 | XY-3: up to 270 |
| No of standards | 10 |
| Sample tube diameter | 13, 16, 20, 25 or 30 mm |
| Sample tube height | 100 mm |

#### XY-2 DUAL-ROW

| 40+40 |
| 16 mm |
| 100 mm |

#### PHOTOGRAMETER

- **Type:** dual beam with same-wavelength reference
- **Wavelength range:** 420 - 900 nm standard, 340 - 900 nm option
- **Flowcell design:** glass barrel with sapphire light pipes
- **Flowcell pathlength:** 10, 30 or 50 mm
- **Flowcell i.d.:** 0.5, 0.7 or 1.0 mm
- **Blank correction:** optional reference flowcell for simultaneous true correction
- **Beam splitter:** randomized quartz optical fiber bundle
- **Light source:** krypton lamp or LED
- **Linear range:** 0 - 1.8 AU
- **Digital resolution:** 2²²
- **Sensitivity:** max. 0.007 AUFS
- **Input and output:** digital
- **Leak detector:** standard

#### PUMP

| No. of pump tubes | 28 |
| No. of air lines | 8 |
| Air injection | electronic control with timing by optical switch |
| Pump control | manual or from PC |
| Speeds | normal, high, intermittent |
| Leak detector | standard |
| Safety switch | magnetic, automatic |

#### CHEMISTRY MODULE

- **No. of manifolds:** 1 - 4, depending on methods
- **Leak detector:** option
- **Hydraulic components:** 2.0 mm high precision glass, with Pt inserts
- **Heating baths:** 25 - 120 °C, with user-replaceable glass or PFA coils
- **Standard methods:** ISO, EPA, DIN, USP and AOAC approved methods available

#### WEIGHTS AND DIMENSIONS

<table>
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<tr>
<th>MODULE</th>
<th>WIDTH CM</th>
<th>DEPTH CM</th>
<th>HEIGHT CM</th>
<th>WEIGHT KG</th>
<th>POWER CONSUMPTION</th>
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<tr>
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<td>33</td>
<td>51</td>
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<td>29</td>
<td>16</td>
<td>50 VAmax.</td>
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<tr>
<td>Chemistry module with heating baths</td>
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<td>3</td>
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<td>16</td>
<td>29</td>
<td>2</td>
<td>50 VA</td>
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ALL MODULES ARE MULTI-VOLTAGE, 50/60 Hz.