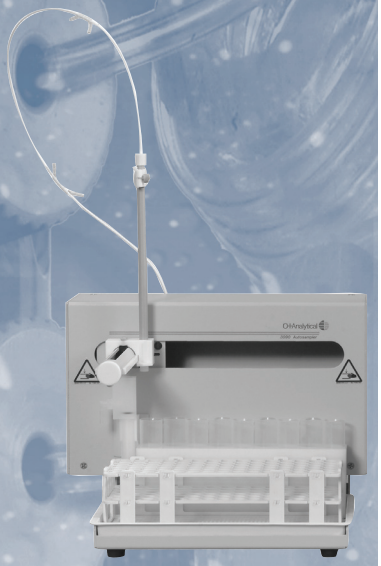
Flow Solution® FS 3100

Automated Chemistry Analyzer



- Performs approved methods for regulatory monitoring of ambient and drinking waters: NPDES, NPDWR, 40CFR Part 136, Standard Methods (APHA–AWWA–WPCF), DIN, ISO
- Performs both flow injection analysis (FIA) and segmented flow analysis (SFA)
- VersaChem Multi-Test Manifold™ allows multiple methods to be run with the same system configuration
- Expanded Range™ Detector supports analyte measurements over a large dynamic range (3–4 orders of magnitude)

Principal Applications

- Drinking water
- Wastewater
- Groundwater
- Surface water
- Industrial waste
- Soil extracts
- Plant digests

Methods

- USEPA
- ASTM
- Standard Methods (APHA–AWWA–WPCF)
- DIN
- ISO

Description and Function

The Flow Solution® FS 3100 Automated Chemistry Analyzer is a modular system for performing continuous flow analysis methods on water samples, soil, or plant extracts and digests using FIA or SFA techniques. The FS 3100 consists of an X-Y-Z autosampler (90 or 360 position), multi-channel precision pump, electrically-actuated sample injection valve, VersaChem Multi-Test Manifold™, and Expanded Range™ photometric or amperometric detector.

The FS 3100 supports two channels for FIA methods and three channels for SFA methods, minimizing the time involved in changing chemistries for different analytes.

Operating Principle

The FS 3100 Automated Ion Analyzer supports and performs two continuous flow analysis techniques: flow injection analysis (FIA) and segmented flow analysis (SFA).

In FIA methods, a highly reproducible sample volume is injected into a carrier stream, followed by downstream reagent mixing under laminar flow conditions for a precise residence time within an analytical cartridge. FIA chemistries produce sharp, transient, and nearly-Gaussian peaks. Precise sample volumes and reaction times do not require reaction completion for accurate measurements. Peak area is used for measurements.

In SFA methods, a sample volume is aspirated into a carrier stream and segmented with air or an inert gas, followed by downstream reagent mixing under turbulent “bolus” flow conditions. The segmentation gas decreases sample dispersion and inter-sample mixing, allowing longer residence time within the analytical cartridge and enabling reactions to reach equilibrium before detection. SFA chemistries produce flat-topped peaks, representing reaction completion or steady state. Peak height is used for measurements.

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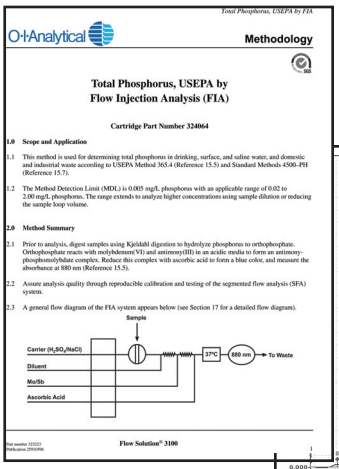
Specifications

3090 Autosampler	90-position, X-Y-Z (90 samples, 9 bulk standards)
Dimensions	25 cm H x 33 cm W x 33 cm D (9.8” H x 13” W x 13” D)
3360 Autosampler (optional)	360-position, X-Y-Z (360 samples, 10 bulk standards)
Dimensions	25 cm H x 52 cm W x 48.2 cm D (9.8” H x 20.5” W x 19” D)
Precision Pumps	8 or 16-channel peristaltic, variable speed, digital control, RS-232
8-Channel Pump	13 cm H x 17.5 cm W x 22 cm D (5” H x 7” W x 9” D); 5.1 kg (12.1 lbs)
16-Channel Pump	13 cm H x 17.5 cm W x 30 cm D (5” H x 7” W x 12” D); 6.5 kg (15 lbs)
Analysis Unit	Comprised of an FIA or SFA flow module and a detector module
Dimensions	15 cm H x 25 cm W x 38 cm D (6” H x 10” W x 15” D)
Flow Modules	FIA includes an injection valve and a heater; SFA includes a heater
Heater	Programmable for operation at ambient, 37 °C, or 50 °C (± 2 °C)
Injection Valve	6-port switching valve
Detectors	Photometric (420-880 nm), Amperometric @ 0.00 V vs. Ag/AgCl
Photometric Detector Flow Cell	5-mm path length (10-mm path length optional), PEEK®
Amperometric Flow Cell	Silver working electrode, silver/silver chloride reference, stainless steel counter electrode
Analytical Cartridge	Contains a chemistry kit, a VersaChem Multi-Test Manifold™, and an analytical method
Analytical Method	Validated FIA and SFA chemistries provided for specific analyses
Chemistry Kit	Pump tubing set, connectors, interference filter, and method documentation
VersaChem Multi-Test Manifold™	Multi-port manifold for sample, carrier, air, reagents, and mixing coils
Power Requirements	110/220 VAC (± 10%); 50/60 Hz
System Software	WinFLOW™ Windows®-based system control, analysis, and data-handling software
PC Specifications	IBM compatible, 1 GB RAM, 3 GHz, CD-ROM, RS-232, Windows® XP Pro
Warranty	12 months on parts and labor

Analytical Methods

Methods supplied with the FS 3100 provide all information necessary to perform continuous flow ion analysis for specific analytes and sample matrices, including method performance data.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Methodology

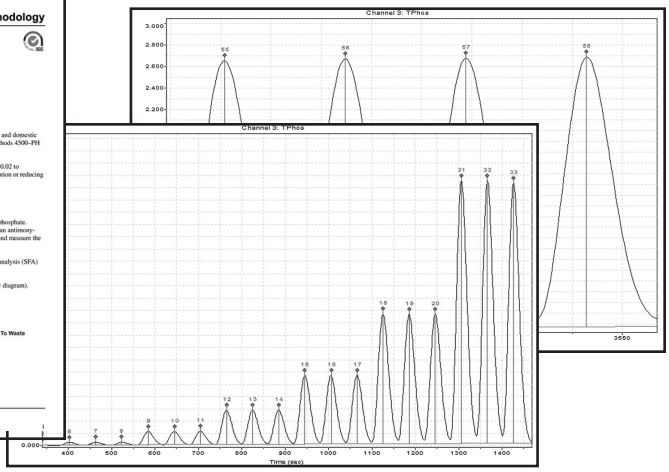
Total Phosphorus, USEPA by Flow Injection Analysis (FIA)

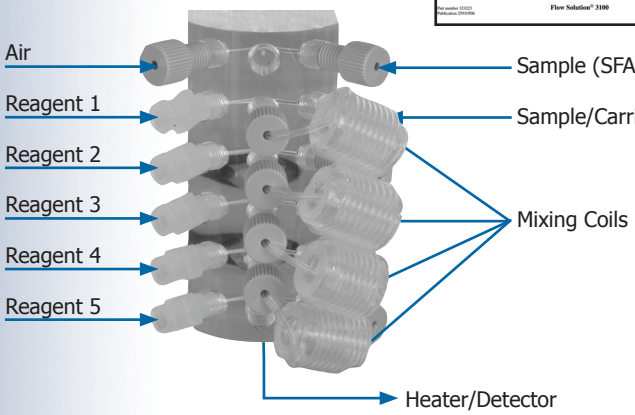
Cartridge Part Number 324064

1.0 Scope and Application

2.0 Method Summary

Flow Solution® 3100





VersaChem Multi-Test Manifold™

The VersaChem Multi-Test Manifold™ allows multiple tests to be run with the same system configuration.

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