autosamplers

UltiMate 3000 Well Plate Autosampler Series

UHPLC+ focused

Dionex products are UHPLC compatible by design, establishing the new standard in conventional LC. Integrating hardware, software, and separation chemistry, Dionex offers UHPLC to everyone—for all needs.

The UltiMate® 3000 Autosamplers ensure reliable, precise, and accurate injections from nL to mL sample volumes supporting pressure up to 103 MPa/15,000 psi for UHPLC applications. They manage flow ranges from nano/capillary to micro and from analytical to semipreparative scale. Industry leading technology, rigorous quality assurance, and predictive performance monitoring assure optimum performance, reliability, and ease of use.

Optimal Performance

- Rapid Separation (RS) autosampler variants support nano/cap, micro, conventional analytical, and UHPLC applications with pressures up to 103 MPa (15,000 psi).
- Standard autosampler variants are UHPLC compatible, supporting pressures up to 62 MPa/9000 psi.
- Any combination of four different sample vial formats, including well plates and Eppendorf tubes, all of which can be used in the same auto-sampling sequence.
- Unique temperature control design to protect thermally-sensitive samples by eliminating destructive temperature gradients in the sample carousel compartment.
- Automated validation procedures, when operated with the Chromeleon® Chromatography Data System software.
- Intuitive predefined diagnostic tests and troubleshooting guides to identify and promptly resolve operational interruptions.
- Access to all fluidic components from the front panel of the autosampler without moving other modules in the UltiMate 3000 stack.
- Fully automated injection, fraction collection, and re-injection in a single instrument.

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DIONEX

Passion. Power. Productivity.

Features, Benefits, and Value of UltiMate 3000 Well Plate Autosamplers	
Feature	**Benefit and Value**
Rapid Separation (RS) autosampler variants support pressures up to 103 MPa/15,000 psi or 90 MPa/ 13,050 psi.	Future-proof autosampler for UHPLC and conventional applications up to 103 MPa/ 15,000 psi at analytical and micro flow rates and 90 MPa/13,050 psi at nano/cap flow rates. Highest application flexibility and maximum sample throughput for ultrahigh speed and ultrahigh resolution LC analyses.
Standard autosampler variants support pressures up to 62 MPa/9,000 psi.	For UHPLC and conventional applications up to 62 MPa/9000 psi at analytical and micro flow rates. High application flexibility and high sample throughput with conventional and state-of-the-art LC.
Fast high-precision drives and in-line split-loop (flow-through) injections	Maximum injection volume accuracy and precision to ensure highly reproducible results and easy method transfer from one system to another. Injection cycle times < 15 s for 5 µL (in-line split-loop autosamplers) for maximum sample throughput even with ultrahigh speed UHPLC applications.
Generous sample carousel design and flexible sample tray arrangement	High sample vial capacity and flexibility for high speed UHPLC applications or unattended long-term operation and maximum vial flexibility for all sample analysis and sample preparation tasks.
Unique liquid cooling design with active condensed humidity removal	Sample carousel temperatures down to 4 °C (22 °C below ambient) ensure sample integrity for thermally labile analytes even for long-term operation. A pump removes condensed humidity from the sample carousel.
Sample loop bypass mode for split-loop (flow-through) autosamplers	Reduces system gradient delay volume and enables overlapping sample aspiration for maximum sample throughput.
Needle-in-needle design (pulled-loop autosamplers)	Supports minute injection volumes as low as 20 nL. Supports all kinds of applications from nano to analytical scale.
Microliter pickup and low dispersion mode (pulled-loop autosamplers)	Enables zero-sample-loss injections and extremely low sample consumption for precious samples; saves valuable sample for other analyses. Reduces sample preparation efforts and enables scale down of sample preparation steps. Reliable peak identification and quantification through enhanced peak shapes and resolution.
User-defined sample preparation and injection programs	Automated sample preparation like dilution and derivatization will be handled by the autosampler to save labor time and yield accurate and precise results.
Injection, fractionation, and re-injection (WPS-3000FC autosamplers)	Sample injection and fractionation in a single instrument for automated off-line multidimensional and multistep liquid chromatography in analytical and micro flow rate ranges.
Extensive autosampler self tests and user-scheduled diagnostic tests	All sensors are checked at startup and during sample processing. To ensure reliable and robust operation. Diagnostic tests indicate even the smallest leaks caused by valve and needle seat wear.
Predictive performance indicators	Counters monitor common wear parts like rotor seal, syringe , needle, and needle seat to easily schedule maintenance and maximize instrument use time.

Design Highlights

High Sample Capacity and Flexibility

The UltiMate 3000 WPS Autosampler Series supports a great variety of sample trays compatible with many sample formats – including micro, analytical, semipreparative, and preparative sample vials; normal and deep well plates; PCR plates; and even Eppendorf tubes (Figure 1 and Table 1). This industry leading variety allows for highest sample capacity and maximum sample flexibility.

Unique Thermal Control for All Sample Tray Formats

Peltier elements in combination with circulating cooling liquid are responsible for the UltiMate 3000 Autosampler's accurate, stable temperature control capabilities. Direct contact between the vial and the temperature regulated surface ensures that samples achieve the actual set point between 4 °C and 45 °C (max. 22 °C below ambient). All thermostatted autosamplers guarantee optimal protection for thermally sensitive analytes.

A built-in peristaltic pump automatically removes water that may accumulate as a result of condensation.

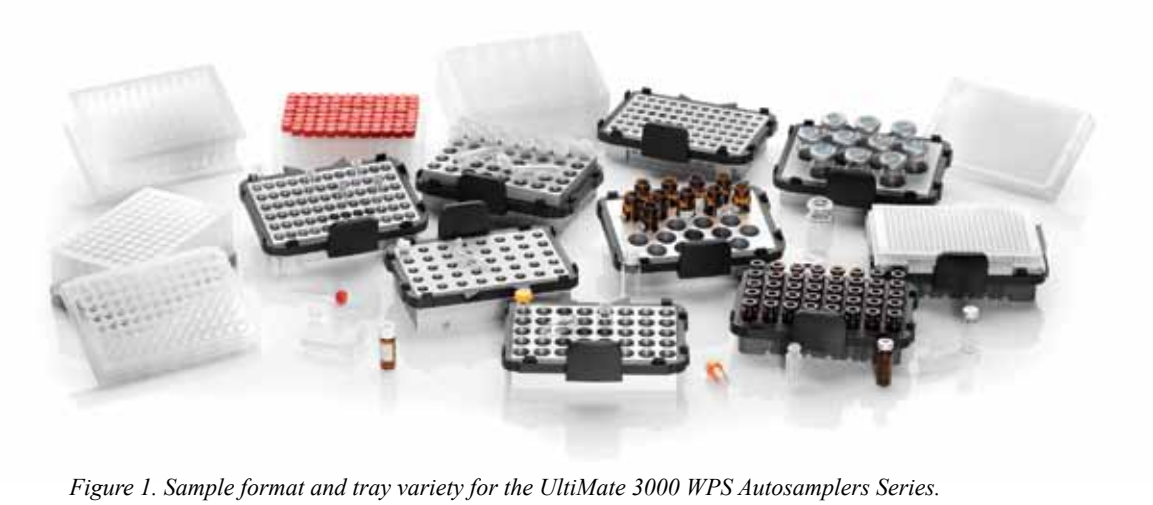

Figure 1. Sample format and tray variety for the UltiMate 3000 WPS Autosamplers Series.

Table 1. UltiMate 3000 Autosampler Sample Tray Formats

Sample Containments	Sample Tray*[1]	Total Vials in Carousel (plus 15 x 10 mL vials)
Micro, cylindrical 0.3 mL vials	0.3 mL rack	3 × 72 = 216
Analytical, conical 1.1 mL vials	1.1 mL rack	3 × 40 = 120
Analytical, cylindrical 1.2 mL minivials	1.2 mL rack	3 × 72 = 216
Analytical, cylindrical 1.8 mL/2 mL vials Micro, conical 250 µL vial inserts	2 mL rack	3 × 40 = 120 3 × 40 = 120
Semipreparative, cylindrical 4 mL vials	4 mL rack	3 × 22 = 66
Preparative, cylindrical 10 mL vials	10 mL rack	3 × 10 = 30
96 normal well plate 384 normal well plate	0.3, 1.1, 1.2, 2, or 10 mL rack	3 × 24 = 72 3 × 96 = 288 3 × 384 = 1152
24 deep well plate*[3] 96 deep well plate 384 deep well plate	Deep well plate support rack	3 × 24 = 72 3 × 96 = 288 3 × 384 = 1152
0.5 mL Eppendorf tubes*[2]	0.5 mL Eppendorf tube rack	3 × 40 = 120
1.5 mL Eppendorf tubes*[2]	1.5 mL Eppendorf tube rack	3 × 40 = 120
Low well PCR plate (8–12 mm) with 384 wells	0.3, 1.1, 1.2, 2, or 10 mL rack + support rack (adapter) for low PCR-plates	3 × 384 = 1152

* 1 Three sample trays can be used in any combination in the autosampler carousel.

*2 The in-line split-loop (flow-through) autosamplers (WPS-3000SL and WPS-3000RS series) support sampling from uncapped (open) Eppendorf tubes. The pulled-loop autosamplers (WPS-3000PL and WPS-3000FC series) support piercing Eppendorf tube caps which are marked or specified as pierceable.

*3 With vial pusher adapter

In-line Split-loop (Flow-through) and Pulled-loop Injection Principle

In-line Split-loop (Flow-through) Autosamplers

Within in-line split-loop autosamplers, the needle, needle seat, and sample loop are integral parts of the high pressure fluidic path (Figure 2). The autosampler aspirates only the sample volume which is injected onto the column. Lowest carryover is achieved since the needle and sample loop are constantly rinsed with mobile phase. Inline split-loop injections are therefore highly accurate and precise, and are adjustable over a wide volume range.

Features and Benefits

- High injection volume flexibility
- Near zero carry over
- No sample loss
- Low sample dispersion
- Excellent injection precision and linearity
- Very short cycle times
- Highest versatility and productivity

Pulled-Loop Autosamplers

In pulled-loop autosamplers, the needle is not an integral part of the high pressure fluidic path (Figure 2). Therefore, all autosampler parts in contact with the sample can be made of inert material. High injection precisions are achieved in full-loop injections at a fixed-sample loop volume. Variable injection volumes are accessible in partial-loop injection mode.

Features and Benefits

- Lowest injection volumes down to the nL range
- Biocompatible flow paths[*1]
- Microliter pick-up – zero sample loss for pulled-loop injections
- Excellent injection precision even at low volume injections – at 20 nL a precision < 1% can easily be achieved.
- Optional fractionation capabilities

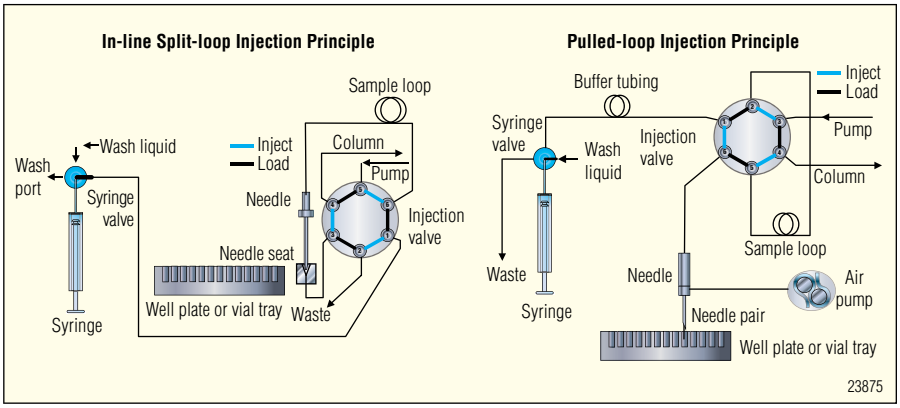

Figure 2. In-line split-loop (flow-through) and pulled-loop injection principle (wash port not shown).

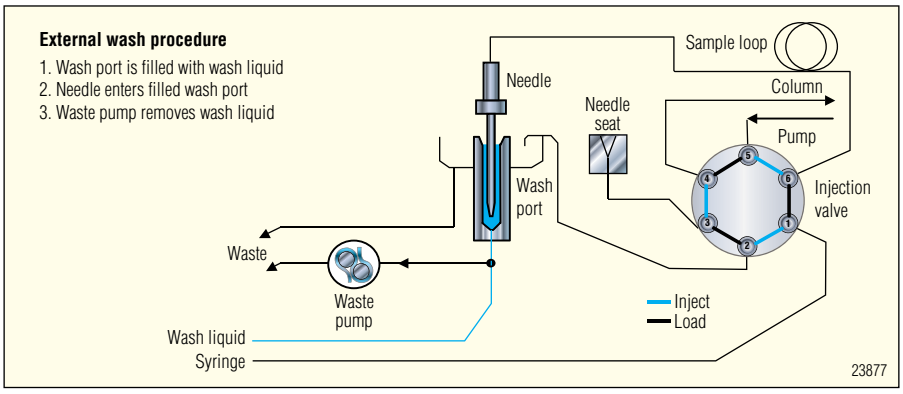

Figure 3. External wash operation of UltiMate 3000 in-line split-loop autosamplers.

The pulled-loop autosamplers are most suited for precise injections even of minute volumes, e.g., in nano LC, with zero sample loss. Maximum sample integrity for metal-sensitive analytes is assured.

[*1] Biocompatible autosamplers are not included in our UHPLC design principles due to limited pressure support of PAEK and PEEK™ components.

Low Carryover for Every Injection

Carryover is of concern in all cases where high and low concentration samples are processed in the same sequence (for example, analysis of environmental samples) or when injecting sticky compounds (for example, distinct proteins that adhere to surfaces in the sampling path). The UltiMate 3000 well plate autosamplers feature active needle wash (Figure 3).

This removes analytes from the outer needle surface and demonstrates carry-over < 0.004 % for in-line split-loop autosamplers (typically < 0.01 % for pulled-loop autosamplers), even for sticky compounds, such as chlorhexidine or beclomethasone (Figure 4).

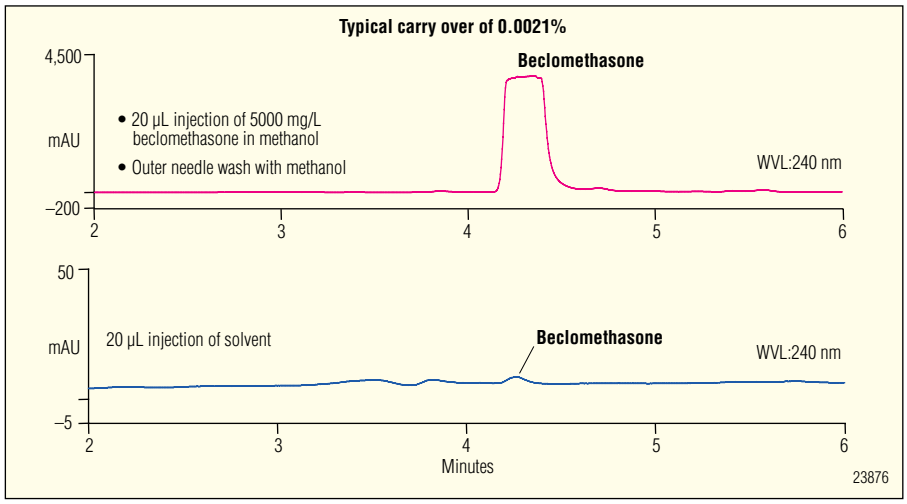

Figure 4. In-line split-loop autosampler carry over example using beclomethasone.

Needle-in-Needle, Pulled-Loop Design for Flexible Sampling from Different Sample Tray Formats

The UltiMate 3000 Autosampler with pulled-loop injection design uses a needle-in-needle injection technique. The outer needle pierces the vial septum or well seal while the inner, biocompatible micro-needle (fused silica or PEEK) then moves into position to aspirate the sample.

The injection system can be programmed to the optimum depth for each sample container format. This technique provides robust operation for different sample tray formats.

Injection and Fractionation

Autosamplers supporting injection and fractionation in a single instrument are based on the pulled-loop injection principle. A second integrated valve (fractionation valve) allows fractionation in additional sample vials located in the sample carousel (Figure 5). Fractions can then be re-injected on a second column e.g., with different selectivity.

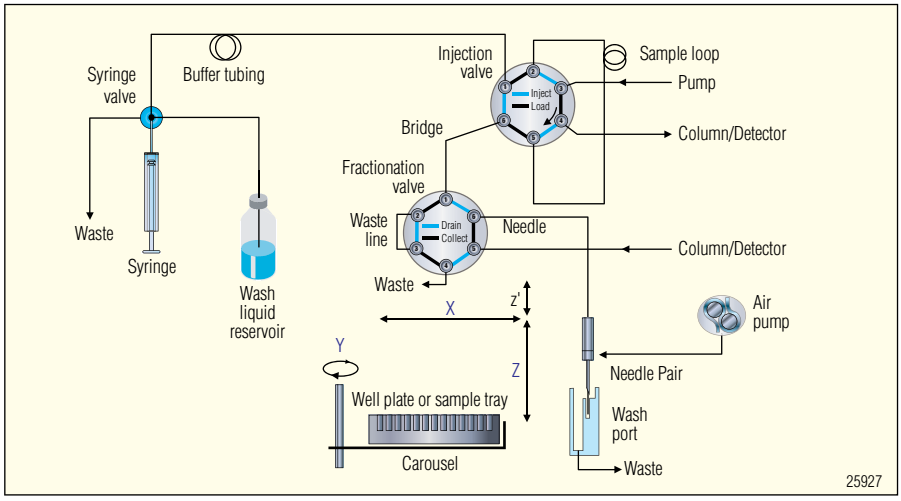

Figure 5. Flow diagram for injection and fractionation on a single instrument (WPS-3000FC).

Dionex offers the widest choice of in-line split-loop (flow-through) and pulled-loop autosamplers (Table 3 and Table 4) covering a large variety of (biocompatible) LC applications like nano/cap, analytical, and semipreparative LC as well as Ultra High Performance LC (UHPLC).

Table 2. UltiMate 3000 Autosampler Application Fields and Sampler Configuration				
Field of Application	**Sampler**	**Max. Operating Pressure (MPa/psi)**	**Recommended Injection Volume Range (µL)**	**Sampler Configuration**
Ultrahigh Performance, Conventional Analytical, and Micro LC	WPS-3000(T)RS Rapid Separation Sampler	103/15,000	1–100 0.2–25 1.5–250 1.5–500	Default configuration With optional 25 µL sample loop With optional 250 µL injection volume kit With optional 500 µL injection volume kit
Analytical and Micro LC	WPS-3000(T)SL Analytical Sampler	62/9000	See WPS-3000(T)RS.	
Analytical LC with Electrochemical Detection	WPS-300TBSL Analytical Sampler	35/5000	1–100	Default Configuration
Semipreparative LC	WPS-3000(T)SL Semipreparative Sampler	25/3626	100–2500 10–1000	Default configuration With optional 1000 µL injection volume kit
Ultrahigh Performance Nano/Cap LC	WPS-3000(T)PL RS Nano/Cap Rapid Separation Sampler	90/13,050	0.02–1 0.02–5 or 0.02–20 0.1–125	Default configuration With optional 5 or 20 µLnanoViper sample loop With optional 125 µL upgrade kit
Nano/Capillary LC	WPS-3000(T)PL Nano/Cap Sampler	35/5000	0.02–1 or 0.02–20 0.02–5 or 0.02–10 0.1–125	Default configuration With optional 5 µL or 10 µL sample loop With optional 125 µL upgrade kit
Injection and Fraction Collection	WPS-3000TFC Analytical Sampler and Fraction Collector	35/5000 Optional: 90/13,050	0.1–50 0.25–250 0.02–1	Default configuration With different sample and buffer loop configuration (included) With optional modification kit for nano/cap applications

Table 3. UltiMate 3000 Biocompatible Autosampler Application Fields and Sampler Configuration				
Field of Application	**Sampler**	**Max. Operating Pressure (MPa/psi)**	**Recommended Injection Volume Range (µL)**	**Sampler Configuration**
Biocompatible Analytical LC	WPS-3000TBPL Biocompatible Analytical Sampler	35/5,000	0.1–50 0.25–250	Default Configuration With different sample and buffer loop/syringe comfiguration (included)
Biocompatible Nano/Capillary LC	WPS-3000TBPL Biocompatible Nano/Cap Sampler	35/5,000	See WPS-3000(T)PL Nano/Cap Sampler	
Biocompatible Injection and Fraction Collection	WPS-3000TBFC Biocompatible Analytical Sampler with Fractionation Valve	35/5,000	See WPS-3000TFC Analytical Sampler with Fractionation Valve	

UltiMate 3000 Rapid Separation Autosamplers for UHPLC, Conventional Analytical, and Micro LC Applications

Whether operating in the conventional pressure range or at ultrahigh pressures, the UltiMate 3000 Rapid Separation Autosamplers assure excellent injection performance for reliable results in conventional LC and high pressure applications like high throughput and high resolution analysis. The WPS-3000RS Autosamplers combine all advantages of the in-line split-loop (flow-through) design with UHPLC performance.

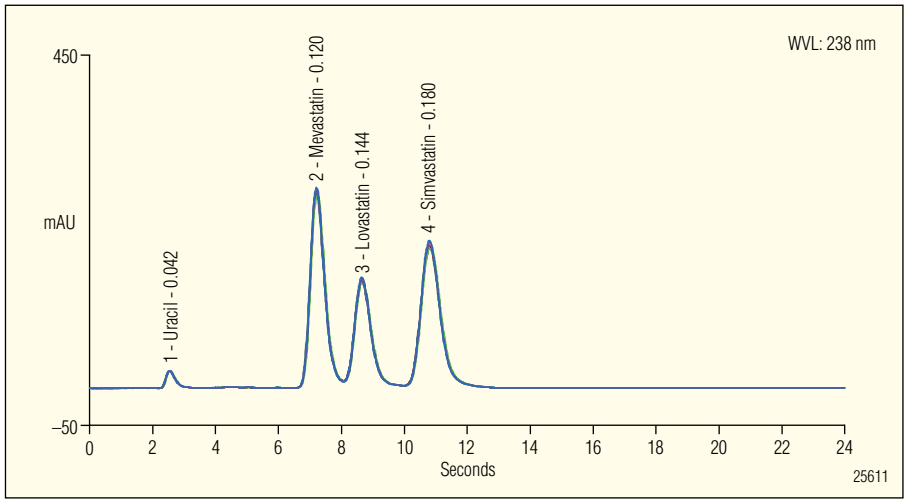

Figure 6. Excellent peak area precision < 0.31% RSD for ten consecutive 1 µL injections at 3.35 mL/min and 74 MPa.

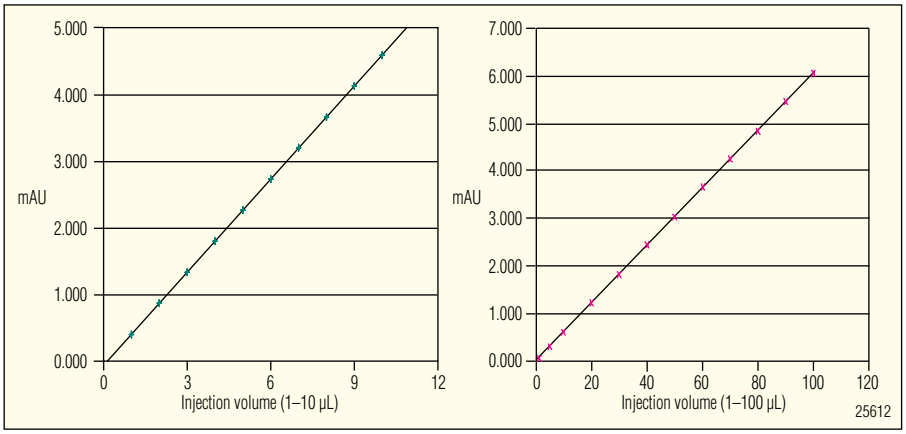

Figure 7. Excellent linearity performance at 1–10 µL (correlation coefficient of 0.999997, 0.13% RSD) and 1–100 µL (correlation coefficient of 0.999998, 0.10% RSD), three replicates per injection) demonstrate the flexibility of the UltiMate 3000 Rapid Separation Autosampler.

Features and Benefits

- Supports pressures up to 103 MPa/15,000 psi.
- Unique injection valve design for extended rotor seal lifetime, even at ultrahigh pressures.
- Peak area precision is typically less than 0.15% for a 5 µL injection in conventional and 0.3% for a 1 µL injection in UHPLC mode (Figure 6).
- Excellent injector linearity ($r^2 > 0.9999$) is achieved due to the combination of a high-precision drive mechanism and in-line split-loop (flow-through) injection principle (Figure 7).
- High injection volume flexibility is guaranteed due to a standard injection volume range of 1–100 µL (recommended range).
- The autosampler can easily be upgraded for micro injection volumes down to 0.2 µL.
- Low extra column volume assures maximum column efficiency for optimal chromatographic resolution even on narrow and microbore columns.
- Low gradient delay volume contribution guarantees real-time gradient response.
- Fast cycle times < 15 s for 5 µL injections in combination with excellent area precisions support reliable high-throughput applications.
- Method transfer of your existing LC method running on an UltiMate 3000 Autosampler to the UltiMate 3000 Rapid Separation Autosampler is easily achieved due to volumetric accuracies better than ±0.5%.

Application Area

The UltiMate 3000 Rapid Separation Autosamplers ideally support ultrahigh pressure, high-throughput, and high-resolution applications for example, in routine analysis in pharmaceutical, food and beverage, environmental, and other applications. Due to their high versatility, they are also best suited for research laboratories pursuing HPLC and UHPLC method development.

UltiMate 3000 Autosamplers for Conventional Analytical and Micro LC Applications

Precise, reliable, and easy to use—these are the most important attributes of the WPS-3000(T)SL and WPS-3000TBSL Analytical Autosamplers. Both instruments are based on the in-line split loop (flow-through) injection design and therefore offer lowest possible cycle times and an excellent injection linearity over a wide injection volume range.

Features and Benefits

- The WPS-3000(T)SL Sampler supports pressures up to 62 MPa/ 9000 psi and enables UHPLC applications.
- The WPS-3000TBSL ensures highest detection sensitivity for LC applications with electrochemical detection at pressures up to 35 MPa/5000 psi.
- Peak area precision is typically less than 0.1 % for 10 µL injections (Figure 8), increasing confidence in your results.
- Excellent injector linearity ($r^2 > 0.9999$) is achieved due to the combination of a high-precision drive mechanism and in-line split loop (flow-through) injection principle (Figure 9).
- Volumetric accuracy (better than ±0.5 % at 50, and 90 µL) guarantees consistent results when transferring a method from one UltiMate 3000 autosampler to another.
- A standard injection volume range (recommended) of 1–100 µL suits most common LC applications.
- The WPS-3000(T)SL can easily be upgraded for injection volumes from 0.2 up to 500 µL.

Application Area

The UltiMate 3000 Analytical Autosamplers are ideally suited for routine analysis in pharmaceutical, food and beverage, environmental, and other applications. Well plate compatible sample trays paired with fast cycle times also support high throughput applications.

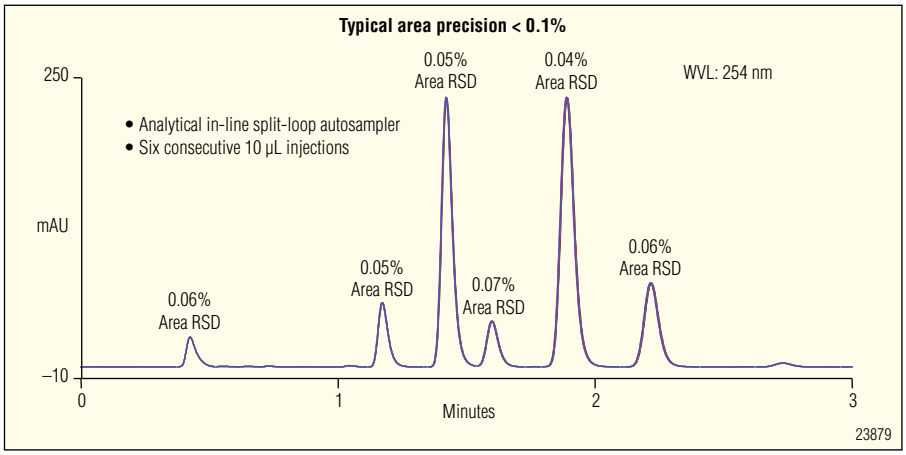

Figure 8. Typical peak area precision < 0.1 % for six consecutive 10 µL injections using the in-line split-loop autosampler.

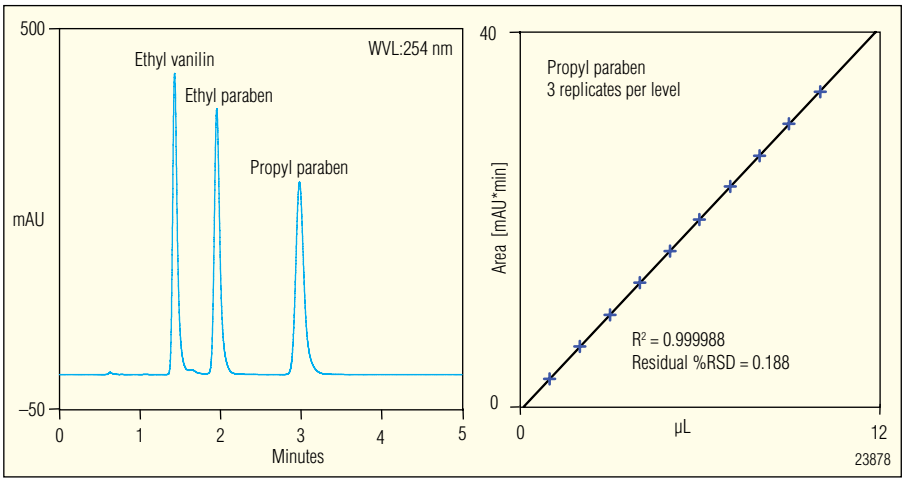

Figure 9. Injector linearity application example of an analytical in-line split-loop autosampler (three replicates per level).

UltiMate 3000 Autosamplers for Semi-preparative LC Applications

The WPS-3000(T)SL Semi-preparative Autosamplers are designed for all semipreparative LC tasks where injections volumes in the mL range and low backpressure contribution from the autosampler are required.

Features and Benefits

- Large volume injections up to 2.5 mL.
- The flow path has been designed to generate low backpressure even at flow rates up to 50 mL/min.
- Supports up to 66 × 4 mL, 30 × 10 mL vials or 3 × 24 deep well plates plus 15 additional 10 mL vials for multiple large volume injections of the same sample (Figure 1 and Table 1).
- Supports also analytical injections down to 10 µL volume when equippedwith the optional 1000 µL sample loop and syringe.

Application Area

Recommended for all semipreparative HPLC instrument configurations.

UltiMate 3000 Autosamplers for Nano and Capillary LC Applications

The WPS-3000(T)PL RS and WPS-3000(T)PL Nano/Cap Autosamplers are based on the pulled-loop injection principle and allow handling of nL sample volumes with zero sample loss. They are specifically designed for the special requirements of ultralow-flow chromatography. The UltiMate 3000 Pulled Loop Rapid Separation Autosampler supports ultrahigh pressure and high-resolution proteomics applications.

Features and Benefits

- Standard and ultrahigh performance versions of the pulled-loop autosamplers are available with maximum operating pressures of 35/5000 MPa/psi and 90/13,050 MPa/psi respectively.
- Offers a wide injection volume range from 20 nL to 125 µL for maximum flexibility.
- Needle-in-needle and pulled-loop injection design allow for excellent injection precisions (typically < 0.3% for 1 µL full loop injections and < 1% for 20 nL partial-loop injection) – independent of the sample format (Figure 10).
- Low-dispersion full-loop and partial loop injections result in an optimized injection profile with significantly reduced peak tailing.
- The µL-pickup routine allows for injections with virtually zero sample loss (1 µL injection out of 1 µL sample).
- The chemically inert flow path of biocompatible autosampler versions protects metal-sensitive biomolecules and columns.
- The microfraction collection option provides access to automated offline multi-dimensional LC applications for increasing peak capacity. With the unique flow path design the Nano/Cap autosampler injects, fractionates and re-injects over 1000 samples (Figure 11).

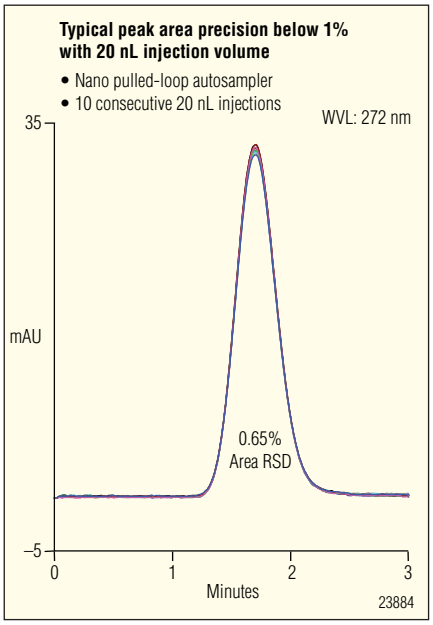

Figure 10. Typical 20 nL injection precision of < 1% (WPS-3000TBPL Nano/Cap autosampler)

Application Area

The UltiMate 3000 Nano/Cap Autosamplers are ideally suited for all LC/MS applications using column i.d. formats of 1 mm or smaller. In combination with micro fraction collection, they are an essential part of the UltiMate 3000 Proteomics MDLC system.

UltiMate 3000 Autosampler for Biocompatible Analytical LC Applications

The WPS-3000TBPL Biocompatible Analytical Autosampler perfectly matches the requirements for injections of complex samples containing biomolecules such as recombinant proteins or monoclonal antibodies.

Features and Benefits

- Inert PEEK flow paths ensure full biocompatibility.
- A wide injection volume range from 0.1 to 250 µL allows for maximum injection flexibility.
- High peak area precision is guaranteed by an excellent injection precision of < 0.3% RSD-even in partial loop mode (Figure 12).
- Low-dispersion full-loop and partial loop injections result in an optimized injection profile with significantly reduced peak tailing.

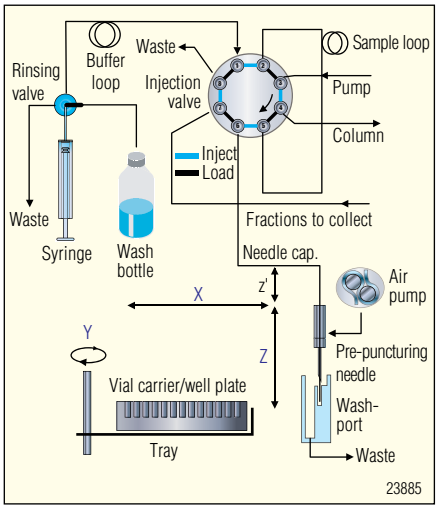

Figure 11. Principles of optional microfraction collection for automated injection, fractionation, and re-injection on a single instrument.

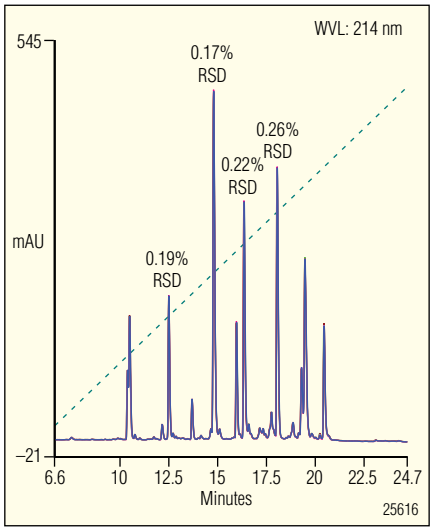

Figure 12. Peak area precision of a lysozyme digest for five consecutive 10 µL partial loop injections (WPS-3000TBPL Biocompatible Analytical Autosampler).

- The µL-pickup routine allows for injections with virtually zero sample loss (1 µL injection out of 1 µL sample).

Application Area

The UltiMate 3000 Biocompatible Analytical Autosampler is best suited for LC analysis of biomolecules using injection volumes of 5 µL or higher.

UltiMate 3000 Autosampler with Fractionation Valve

The UltiMate 3000 Autosampler with fractionation valve (WPS-3000FC) supports sample injection and fractionation.

The WPS-3000FC is available in stainless steel and biocompatible PAEK versions (Figure 13), making it an ideal tool for biomolecule analysis, including protein and antibody fractionation and purification.

The instrument fully automates off-line multidimensional and multistep liquid chromatography in analytical and micro flow rate ranges. It allows the combination of columns different in chemistry and internal diameter on a single LC system with dual-gradient flow delivery.

In combination with the Extended Fraction Collection capabilities of the Chromeleon Chromatography Data System software, the WPS-3000FC enables fully automated injection, fractionation, and re-injection of samples.

Figure 13. The WPS-3000TBFC features two biocompatible PAEK valves that allow sample injection, fractionation, and automated reinjection.

Features and Benefits

- Wide application flexibility, including automated off-line 2D-LC, multistep protein purification/analysis, sample derivatization, protein digestion, neutralization.
- Automated re-injection of samples reduces manual handling steps and ensures the highest level of precision.
- Reduced bench space required.
- Sample and fraction cooling assures biological sample integrity.
- Three well plate capacity and up to 1100 sample and fraction positions.
- The needle-in-needle design allows fractionation in (sealed) well plates and capped or uncapped vials.
- Fraction collection of flow rates up to 6 mL/min.
- Sample compartment heating enhances sample derivatization.
- The optimized flow path (Figure 5) and low delay volume assure that. chromatographic resolution is maintained.
- Chromeleon Chromatography Data System software for advanced workflows.
- Software templates for automated off-line 2D-LC.
- The WPS-3000TFC with stainless steel fluidics supports pressures up to 35 MPa/5000 psi, but can be equipped with an optional 90 MPa/13,050 psi valve for UHPLC applications.

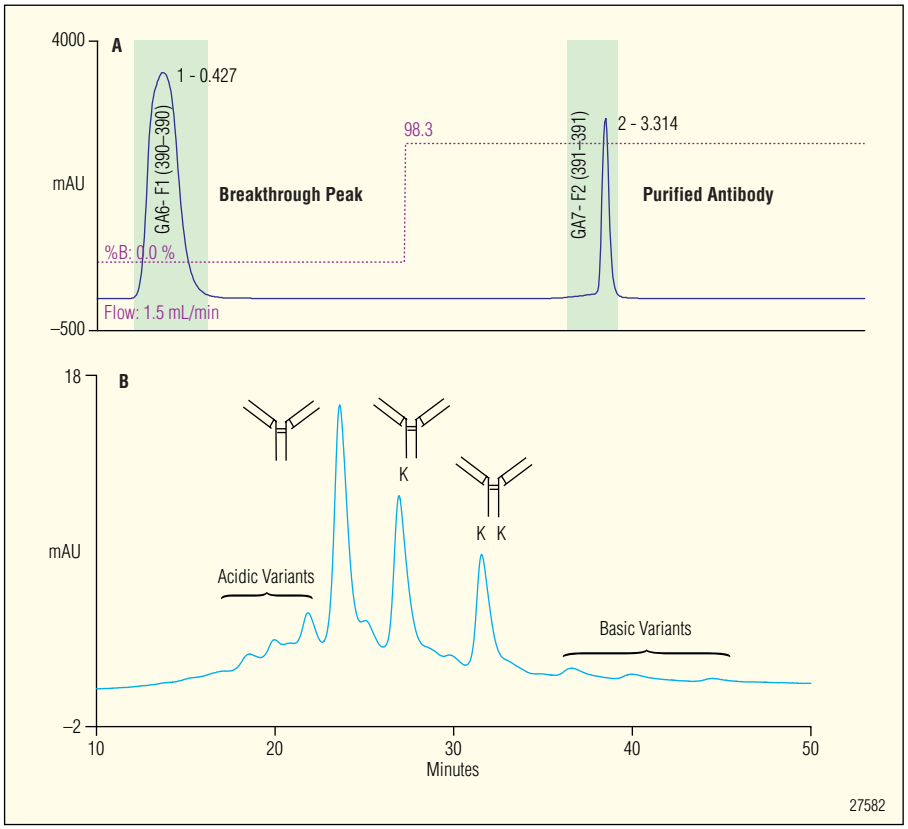

Figure 14. A) Automated monoclonal antibody purification on Protein A and B) isoform separation on a ProPac® WCX column.

Application Field

Sample handling and derivatization, purification, and HPLC analysis can be programmed both easily and in depth which gives the instrument unique capabilities in the fields of sample purification, standard HPLC, and QC.

Protein Purification and Analysis

In order to improve sample throughput in bio-pharmaceutical laboratories, the automation of protein purification and analysis is of interest. The UltiMate 3000 LC system with dual gradient pumps and fractionation option allows to fully automating purification and analysis, e.g., combining affinity with SEC or IEX columns. An example of protein purification run with fraction collection is shown in Figure 14.

SPECIFICATIONS I

	WPS-3000(T)RS Rapid Separation Autosamplers	WPS-3000(T)SL and WPS-3000TBSL Analytical Autosamplers	WPS-3000(T)SL Semipreparative Autosamplers
Sample capacity	216 × 0.3 mL vials, 120 × 1.1 mL conical vials, 216 × 1.2 mL vials, 120 × 1.8 mL/2.0 mL vials, 66 × 4 mL vials, 30 × 10 mL vials, 3 × 24 deep well plates, 96 and/or 384 normal or deep well plates, 3 × 40 0.5 mL and/or 1.5 mL Eppendorf tubes*, and/or 3 × 384 low well PCR plates + 15 × 10 mL vials (depending on sample tray configuration)		
Injection methods	In-line split-loop (flow-through) injections, bypass mode, user-defined programs		
Injection volume range (recommended)	0.01–100 µL (1–100 µL) Optional: 0.2–25 µL, 1.5–250 µL, 1.5–500 µL (not for WPS-3000TBSL)		0.01–2500 µL (100–2000 µL) Optional: 0.01–1000 µL (10–1000 µL)
Injection volume accuracy	± 0.5% at 20 µL	± 0.5% at 50 and 90 µL	± 1 % at 2000 µL
Minimum sample required	1 µL out of 5 µL (250 µL conical vial)		< 0.3% RSD at 100 µL (typically < 0.15% RSD), caffeine in water
Injection volume precision	< 0.25% RSD at 5 µL (typically <0.15% RSD), caffeine in water		n.a.
Linearity	Corr. coeff. > 0.9999, RSD <0.5% at 5–90 µL, caffeine in water		Corr. coeff. > 0.9995, RSD < 1% at 100–2000 µL, caffeine in water
Needle wash	Active external needle wash		
Carry over	< 0.004% for caffeine at 20 MPa with external wash	< 0.004% for caffeine at 7.5 MPa with external wash	
Injection cycle time	< 15 s for 5 µL		< 20 s for 100 µL
Sample thermostatting	4–45 °C or 22 °C below ambient (thermostatted sampler versions)		
Sample temperature accuracy	± 2 °C		
Additional specifications	Dimensions (h × w × d): 36 × 42 × 51 cm (14.2 × 16.5 × 20 in.); Power requirements 100–120 V, 60 Hz; 200–240 V, 50 Hz; PC connection: all functions controllable via USB; integrated USB hub with 3 USB 1.1 ports; Weight: max. 23 Kg (51 Ib) including cooling; I/O interfaces: 4 digital inputs, 4 relay outputs		

* The in-line split-loop (flow-through) autosamplers (WPS-3000SL and WPS-3000RS series) support sampling from uncapped (open) Eppendorf tubes. The pulled-loop autosamplers (WPS-3000PL and WPS-3000FC series) support piercing Eppendorf tube caps which are marked or specified as pierceable.

SPECIFICATIONS II

	WPS-3000(T)PL RS Nano/Cap Autosamplers	WPS-3000(T)PL Nano/Cap and WPS-3000TBPL Biocompatible Nano/Cap Autosamplers	WPS-3000TBPL Biocompatible Analytical Autosampler	WPS-3000TFC Analytical and WPS-3000TBFC Biocompatible Analytical Autosampler with Fractionation Valve
Sample capacity	216 × 0.3 mL vials, 120 × 1.1 mL conical vials, 216 × 1.2 mL vials, 120 × 1.8 mL/2.0 mL vials, 66 × 4 mL vials, 30 × 10 mL vials, 3 × 24 deep well plates, 96 and/or 384 normal or deep well plates, 3 × 40 0.5 mL and/or 1.5 mL Eppendorf tubes*, and/or 3 × 384 low well PCR plates + 15 × 10 mL vials (depending on sample tray configuration; also for fractionation in (un-)capped vials, WPS-3000T(B)FC)			
Injection methods	Full-loop and partial-loop injections, low dispersion mode, microliter pickup, user-defined programs			
Injection volume range (recommended)	0.001–20 µL (20 nL–20 µL)		0.01–250 µL (0.1–250 µL)	
Fractionation Modes	n.a.	n.a.	n.a.	Time slices, peak signal, manual and external trigger
Injection volume accuracy	n.a			
Minimum sample required	1 µL out of 1 µL (microliter pickup)			
Injection volume precision	< 0.4% RSD at 1 µL in full-loop and < 1% RSD at 200 nL partial-loop mode, caffeine in water		< 0.25% RSD at 5 µL in full-loop and < 0.3% RSD at 5 µL and 20 µL partial-loop mode, caffeine in water	
Linearity	Corr. coeff. > 0.9995, at 100–500 nL, partial-loop injection, caffeine in water		Corr. coeff. >0.9999, RSD <0.5% at 5–30 µL, caffeine in water	
Needle wash	Active external needle wash			
Carry over	< 0.02% for caffeine with external wash			
Injection cycle time	< 30 s for 1 µL full-loop injection		< 60 s for 5 µL full-loop injection, < 90s for 5 µL partial-loop injection	
Sample thermostatting	4–45 °C or 22 °C below ambient (thermostatted sampler versions)			
Sample temperature accuracy	± 2 °C			
Additional specifications	Dimensions (h × w × d): 36 × 42 × 51 cm (14.2 × 16.5 × 20 in.); Power requirements 100–120 V, 60 Hz; 200–240 V, 50 Hz; PC connection: all functions controllable via USB; integrated USB hub with 3 USB 1.1 ports; Weight: max. 23 Kg (51 Ib) including cooling; I/O interfaces: 4 digital inputs, 4 relay outputs			

* The in-line split-loop (flow-through) autosamplers (WPS-3000SL and WPS-3000RS series) support sampling from uncapped (open) Eppendorf tubes. The pulled-loop autosamplers (WPS-3000PL and WPS-3000FC series) support piercing Eppendorf tube caps which are marked or specified as pierceable.

ORDERING INFORMATION

In the U.S., call (800) 346-6390 or contact the Dionex Regional Office nearest you. Outside the U.S., order through your local Dionex office or distributor. Refer the following part numbers: For more information on different autosampler configurations, please contact your local sales representative.

UltiMate 3000 Autosamplers	Part Number
Rapid Separation Thermostatted Autosampler WPS-3000TRS	5840.0020
Rapid Separation Autosampler WPS-3000RS	5840.0010
Analytical Thermostatted Autosampler WPS-3000TSL	5822.0020
Analytical Autosampler WPS-3000SL	5822.0010
Analytical Thermostatted Autosampler WPS-3000TBSL for Electrochemical Detection	5827.0020
Semipreparative Thermostatted Autosampler WPS-3000TSL	5822.0028
Semipreparative Autosampler WPS-3000SL	5822.0018
Rapid Separation Thermostatted Nano/Capillary Autosampler WPS-3000TPL RS	5826.0020
Rapid Separation Nano/Capillary Autosampler WPS-3000PL RS	5826.0010
Nano/Capillary Thermostatted Autosampler WPS-3000TPL	5820.0020
Nano/Capillary Autosampler WPS-3000PL	5820.0010
Biocompatible Nano/Capillary Thermostatted Autosampler WPS-3000TBPL	5821.0020
Biocompatible Analytical Thermostatted Autosampler WPS-3000TBPL	5823.0020
Analytical Thermostatted Autosampler WPS-3000TFC with Fractionation Valve	5824.0020
Biocompatible Analytical Thermostatted Autosampler WPS-3000TBFC with Fractionation Valve	5825.0020

Accessories	Part Number
Sample tray for 72 cylindrical 0.3 mL vials	6820.4091
Sample tray for 40 conical 1.1 mL vials	6820.4087
Sample tray for 72 cylindrical 1.2 mL vials	6820.4090
Sample tray for 40 cylindrical 1.8/2 mL vials	6820.4070
Sample tray for 22 cylindrical 4 mL vials	6820.4084
Sample tray for 10 cylindrical 10 mL vials	6820.4086
Sample support rack for deep well plates, 34–46 mm	6820.4079
Sample support rack for deep well plates, 30–36 mm	6820.4083
Support rack (adapter) for low well PCR plates, 8–12 mm	6820.4088
Sample tray for 0.5 mL Eppendorf tubes	6820.4096
Sample tray for 1.5 mL Eppendorf tubes	6820.4094
Vial Pusher Adapter	6820.2402
Transparent front cover	6820.1419
Sample loop, 25 µL, WPS-3000(T)RS and WPS-3000(T)SL Analytical	6820.2415
Injection volume kit, 250 µL, WPS-3000(T)SL Analytical and WPS-3000(T)RS	6822.2432
Injection volume kit, 500 µL, WPS-3000(T)SL Analytical and WPS-3000(T)RS	6822.2433
Injection volume kit, 1000 µL, WPS-3000(T)SL Semipreparative	6822.2436
Injection valve upgrade, 90 MPa/13,050 psi, SST, WPS-TFC	6826.0011

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