

Ultra High Performance Liquid Chromatograph Front End System for LC/MS







SIL-30A

Multiplate Autosam



CMP

- Ultralow (near-zero) carryover
- Outstanding injection mechanism assures precision when injecting small volumes
- Open-access design enables the loading of samples, even during analysis



To speed up R&D in such areas as pharmacokinetics (drug manufacturing), it has become increasingly necessary to analyze large numbers of samples at high speed and high precision. In response to these demands, the multiplate-compatible SIL-30ACMP autosampler has been added to the Nexera UHPLC series. The SIL-30ACMP achieves an ultrafast injection performance exceeding that of current models while maintaining ultralow carryover performance. In addition, up to 6 microtiter plates can be loaded, enabling a maximum of 2304 samples to be analyzed continuously. By incorporating these various functions, the SIL-30ACMP Autosampler is ideally suited as a front-end LC for LC/MS and LC/MS/MS systems.



more Speed High-speed injection significantly improves throughput in multi-sample processing

High-speed injection of 7 seconds enables ultrafast LC/MS/MS analysis

Achieve ultrafast LC/MS/MS analysis by combining the SIL-30ACMP, featuring the fastest injection operating time of just 7 seconds and an analysis cycle of 14 seconds, with the ultrafast positive/negative ionization switching (15 msec) and high-speed scanning (15,000 u/sec) of the Shimadzu LCMS-8040/LCMS-8030 Triple Quadrupole Mass Spectrometers.



Event #	Compound	Q1 <i>m/z</i>	Q3 <i>m/z</i>
1	Lidocaine	235.4	86.1
2	Diphenhydramine	256.1	167.1
3	Imipramine	281.1	86.1

Column: Shim-pack XR-ODS II (30 mmL. × 1.5 mml.D., 2.2 µm) Mobile phase: 25% acetonitrile aqueous solution containing 0.1% formic acid Flow rate: 1.2 mL/min

Ionization mode: ESI(+)

Improved overall analysis throughput

Even on current models, use of the SIL-30ACMP speeds up analysis. The following example shows that the analysis time can be shortened by at least 2 hours when an injection is performed 1000 times using the SIL-30ACMP.



near ZERO Carryover Ultralow (near-zero) carryover

Ultralow carryover achieved without rinsing

When rinsing is performed to keep carryover low, the total analysis time sometimes increases as the number of analyses increases. Nexera autosamplers excel in suppressing carryover even without rinsing.



Ultralow carryover even on a high-sensitivity LC/MS/MS

Ultralow carryover performance is required with LC/MS systems. The SIL-30ACMP demonstrates exceptional carryover performance even on compounds such as chlorhexidine that are very prone to adsorption. Moreover, the SIL-30ACMP features an improved rinsing mechanism to achieve even lower carryover.



Improvements in high-sensitivity analysis and quantitative precision achieved by ultralow carryover

In the batch analysis of multiple components, components with greatly differing polarities are frequently analyzed together. In cases such as this, sufficient rinsing may not be achieved using one type of rinse solution. To combat this, the

Multi-rinse mechanism supporting up to 4 solutions

SIL-30ACMP has not only been designed with a hardware structure to which components are less likely to adsorb, but also has a modified rinse mechanism designed to achieve even lower carryover.



Discharge to drain port

carryover is likely to occur. On the SIL-30ACMP, the needle port is rinsed automatically.

more Reliable Outstanding injection mechanism assures precision when injecting small volumes

Wide linearity from 0.1 μ L to 50 μ L

The SIL-30ACMP supports an injection volume range of 0.1 μ L to 50 μ L. Linearity is achieved within a broad injection range from injection of small volumes required for UHPLC up to the order



As shown in the figure to the right, column sizes with an I.D. of approximately 2 mm, which are often used on a UHPLC, are susceptible to the influence of sample solvents, and it may be difficult to increase the injection volume. However, since the SIL-30ACMP is capable of high-precision injection of small volumes, the influence of sample solvents can be suppressed even if pretreated organic solvent-rich samples are injected directly.

In the case of sample solvents having an elution strength greater than that of the mobile phase, the peak shape is sometimes deformed when the injection volume is increased.

of several tens of μ L used on conventional models. The SIL-30ACMP provides excellent repeatability even in the injection of a volume of 1 μ L or less.

Injection Volume (µL)	Repeatability $(n = 6)$	Injection Volume (µL)	Repeatability $(n = 6)$
0.1	0.67%	2	0.09%
0.2	0.32%	5	0.05%
0.5	0.26%	10	0.05%
0.7	0.14%	20	0.04%
1	0.11%	50	0.03%
0.7	0.14%	20 50	0.04% 0.03%





more Capacity Open-access design enables the loading of samples, even during analysis

Mixture of 3 plates possible

The SIL-30ACMP accommodates 6 microtiter plates (96/384MTP, DWP) or plates for 1.5 mL vials. With 96-well plates, up to 576 samples can be loaded, and with 384-well plates, up to 2304 samples can be loaded at a time. Even with 1.5 mL vials, 324 samples can be loaded, which means that a high quantity of samples can be handled with sufficient margin even as a standalone unit.

Designed with emphasis on open-access

In an open-access environment, in which two or more researchers share one system, the ability to load different plates on each rack becomes all the more advantageous. The SIL-30ACMP provides a flexible analysis environment where, for example, one person can be performing on-time analysis with 1.5 mL vials while another is loading a microplate for



large-volume analysis. Vials or plates can be replaced even while analysis is in progress. Moreover, the SIL-30ACMP is designed to prevent your hands from coming into contact with the arm or other moving parts (closed-type design). This prevents unexpected accidents during sample replacement from happening.

The Optimal Liquid Chromatograph Front End System for High-Sensitivity and High-Speed Mass Spectrometry

Also Compatible with Other Mass Spectrometer Brands

In recent years, mass spectrometers have become faster and more sensitive, and liquid chromatographs must follow this trend. The SIL-30ACMP is the optimal system for use as a



With its uniquely shaped body, the LCMS-8080 features the highest sensitivity of all Shimadzu triple quadrupole mass spectrometers. It demonstrates remarkable sensitivity regardless of the application, whether drug development/manufacturing, clinical research, foods/environmental analysis, or pharmaceutical screening. liquid chromatograph front end, not only for the Shimadzu Triple Quadrupole LCMS-8040, LCMS-8050 and LCM-8080, but also for other vendors'mass spectrometers.

Ultra-high-speed LC/MS/MS is achieved by combining this system with the Triple Quadrupole LCMS-8050, which features the fast scan speeds.



Minimized the column - mass spectrometer distance

On an LC/MS system, shortening the piping from the column to the MS is important. The optional CTO-30AS Column Oven is installed on the side of the SIL-30ACMP. Its installation height (3 levels) and angle (between vertical and almost horizontal) can be adjusted to align with the height of the detector. Since the column outlet can be aligned with the detector's entrance and the height of the LC/MS interface, piping after exiting the column is much shorter. This minimizes peak dispersion and achieves ultrafast, high-separation analysis by making full use of the column's performance.



Open-access improves analysis efficiency

Ultrafast analysis of a high quantity of samples by open-access

Three sample racks in the SIL-30ACMP are recognized automatically and allow samples to be loaded at any time except when samples are being injected. Two or more researchers can comfortably share one system. Analyses that used to require multiple systems can now be conducted using one system, saving energy and reducing running costs. A comfortable analysis environment can be built by combining the SIL-30ACMP with Open Solution open-access software.



Combine the SIL-30ACMP with the single-quad LCMS-2020 to process a large number of compounds simply and quickly.

Open Solution provides for a simple analysis environment

Because Open Solution uses Microsoft Corporation's Internet Explorer, there is no need to install any other special software on each PC. Moreover, there are only three operations from login to start of analysis. Analytical results can also be quickly checked on Internet Explorer and easily output in predetermined formats.





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