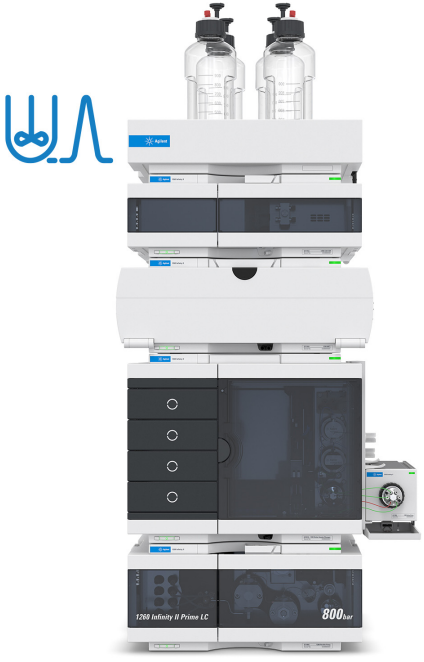
Agilent InfinityLab LC Series
Online LC

Systems Manual and Quick Reference



Notices

Document Information

Document No: D0007568 Rev. C
Edition: 07/2023

Copyright

Agilent Technologies
Hewlett-Packard-Strasse 8
76337 Waldbronn, Germany

Warranty

The material contained in this document is provided "as is," and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

U.S. Government Restricted Rights. Software and technical data rights granted to the federal government include only those rights customarily provided to end user customers. Agilent provides this customary commercial license in Software and technical data pursuant to FAR 12.211 (Technical Data) and 12.212 (Computer Software) and, for the Department of Defense, DFARS 252.227-7015 (Technical Data - Commercial Items) and DFARS 227.7202-3 (Rights in Commercial Computer Software or Computer Software Documentation).

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

In This Guide...

This manual covers the Agilent 1260 Infinity II Prime Online LC System and 1290 Infinity II Bio Online LC System.

1 Introduction

This chapter gives an introduction to the Online LC Systems.

2 Configuration Settings

This chapter describes how to configure the system.

3 Quick Start Guide

This chapter provides information on running an Online LC System.

4 Parts and Consumables

This chapter provides information on additional parts and consumables.

5 Appendix

This chapter provides additional information on safety, legal, and web.

Contents

1 Introduction

This chapter gives an introduction to the Online LC Systems.

Product Description 1260 Infinity II Prime Online LC System

The 1260 Infinity II Prime Online LC System is a process analysis system enabling automated process monitoring, providing real-time data for greater control and faster understanding of processes.

The system supports direct injections for fast process monitoring. It also features retain-sample functionality for dilutions or automated sample preparation steps, multimethod analysis, or sample archiving purposes for offline quality control.

Features 1260 Infinity II Prime Online LC System

- Dedicated process analytical technology (PAT) tool for online and at-line process analysis via LC applications.
- Enables fast process monitoring of critical process parameters (CPPs) and critical quality attributes (CQAs) via direct injections, providing real-time data for greater control and faster understanding of processes.
- Features retain-sample functionality for dilutions (including reaction quenching), multimethod analysis, automated sample preparation, additional offline quality control, or sample archiving purposes.
- Brings hybrid injection technology to the LC world: Both classical flow-through injection and Feed Injection are supported, guaranteeing seamless method transfer and the capability to mediate strong sample diluent effects via Feed Injection.
- Enables utmost control over the process sample and facilitates method development.
- Coordinates sampling and sample analysis via Agilent Online LC Monitoring Software, compatible with OpenLab CDS 2 and designed for process applications.
- Online LC Monitoring Software allows for intuitive sample scheduling to quickly set up sampling events, and provides data visualization tools such as trending plots to easily monitor the process.
- Supports flow rates up to 5 mL/min within a pressure range up to 800 bar for maximum application flexibility.

Product Description 1290 Infinity II Bio Online LC System

The 1290 Infinity II Bio Online LC System is designed for the comprehensive analysis and real-time process monitoring in the (bio-)pharmaceutical industry. Combining the high-performance and biocompatible features of the 1290 Infinity II Bio LC System with the online monitoring capabilities of the 1260 Infinity II Prime Online LC System, this integrated system empowers scientists with enhanced capabilities and efficient control over their analytical and process monitoring needs. It enables precise separation and analysis of biomolecules, while providing real-time process monitoring, immediate feedback for optimization, and significant time and resource savings.

Features 1290 Infinity II Bio Online LC System

- Dedicated process analytical technology (PAT) tool for online and at-line process analysis via LC applications.
- Power range combines ultrahigh pressure up to 1300 bar and high analytical flow rates up to 5 mL/min for maximum UHPLC performance.
- Enables fast process monitoring of critical process parameters (CPPs) and critical quality attributes (CQAs) via direct injections, providing real-time data for greater control and faster understanding of processes.
- Features retain-sample functionality for dilutions (including reaction quenching), multimethod analysis, automated sample preparation, additional offline quality control, or sample archiving purposes.
- Brings hybrid injection technology to the LC world: supports both classical flow-through injection and Agilent Feed Injection for seamless method transfer and mediation of strong sample diluent effects.
- Online LC Monitoring Software allows for intuitive sample scheduling, quick setup of sampling events, and provides data visualization tools such as trending plots for easy process monitoring, compatible with OpenLab CDS 2 and designed for process applications.
- Biocompatible solvent and sample flow path ensure integrity of biomolecules and minimize unwanted surface interaction.
- High salt tolerance and wide pH range offer enhanced flexibility and robustness for increased instrument uptime.
- Wide range of sensitive optical detection capabilities with various flow cells for VWD, DAD, FLD, Bio MDS, or LC/MS detection for highest adaptability.

System Components

1260 Infinity II Prime Online LC System Components

The Agilent 1260 Infinity II Prime Online LC System consists of the following components:

- 1260 Infinity II Flexible Pump (G7104C)
- 1260 Infinity II Online Sample Manager Set (G3167AA):
  - 1260 Infinity II Online Sample Manager (G3167A)
  - External Sampling Valve: Universal Valve Drive (G1170A), equipped with a 3-position/6-port FI Valve
- 1260 Infinity II Multicolumn Thermostat (G7116A)
- 1260 Infinity II Diode Array Detector (G7115A DAD), 1260 Infinity II Variable Wavelength Detector (G7114A VWD), 1260 Infinity II Refractive Index Detector (G7162A RID), or 1260 Infinity II Fluorescence Detector (G7121A FLD)
- Solvent Cabinet

The 1260 Infinity II Prime Online LC is described in more detail in the following sections. The primary configuration choice of the modules is stacked on the InfinityLab FlexBench to ensure highest flexibility.

For specification, please see the individual module user documentation.

Flexible Pump G7104C

The Agilent 1260 Infinity II Flexible Pump improves your everyday efficiency by combining the performance of a high-pressure mixing UHPLC pump with the flexibility of a low-pressure mixing UHPLC pump.

The power range of 5 mL/min with a maximum pressure up to 800 bar allows to run HPLC and UHPLC methods on the same LC system. Intelligent System Emulation Technology enables the transfer from existing methods from different LC systems - current Agilent systems as well as instruments from other manufacturers.

The Agilent Inlet Weaver mixer, active damping, or the optional Agilent Jet Weaver mixers for additional mixing capacity achieve high analytical efficiency.

The established multipurpose valve enhances laboratory efficiency by adding useful functionalities, for example, mixer in/out switch, filter backflush, or automatic purge.

BlendAssist software simplifies your workflow with accurate buffer/additive blending.

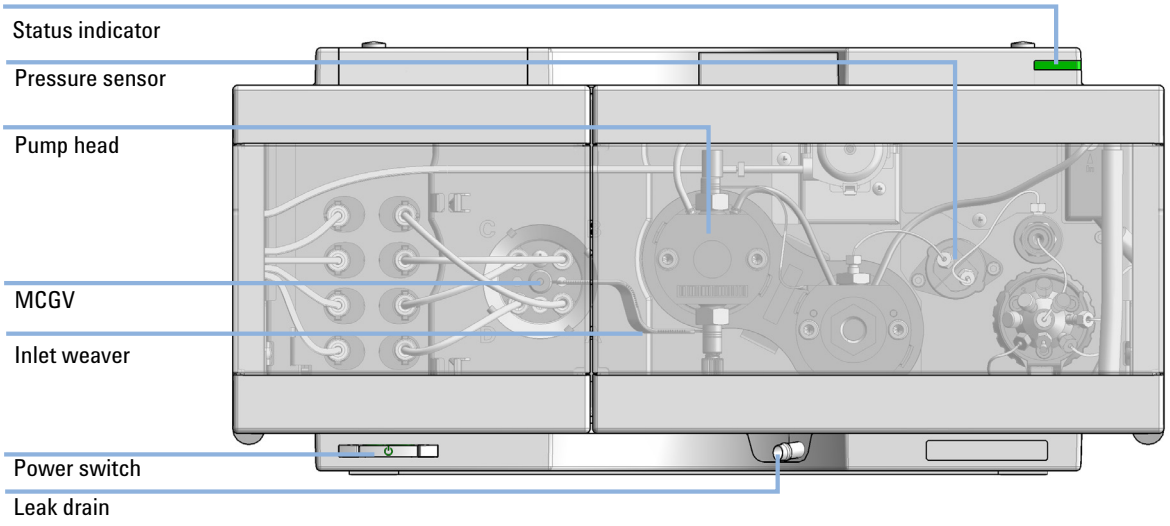


Figure 1 Overview of the Flexible Pump

Online Sample Manager Set G3167AA

The Agilent 1260 Infinity II Online Sample Manager Set (G3167AA) consists of the Agilent 1260 Infinity II Online Sample Manager (G3167A) and the Agilent 1290 Infinity II Valve Drive (G1170A) with External Sampling Valve, see Figure 2 on page 12.

Online Sample Manager G3167A

The Agilent 1260 Infinity II Online Sample Manager is an online sampling module that connects the analytical world with the process world. The module provides automated sample analysis via direct injections or retained samples from flow reactors, batch reactors, as well as upstream bioreactors and downstream purification devices.

The Online Sample Manager supports both classical flow-through injection and Feed Injection, mediating the chromatographic sample diluent incompatibility of challenging process samples. The Online Sample Manager provides automated dilutions of up to 1:1000, retain-sample functionality, and direct analysis of the process samples, as well as automated sample preparation.

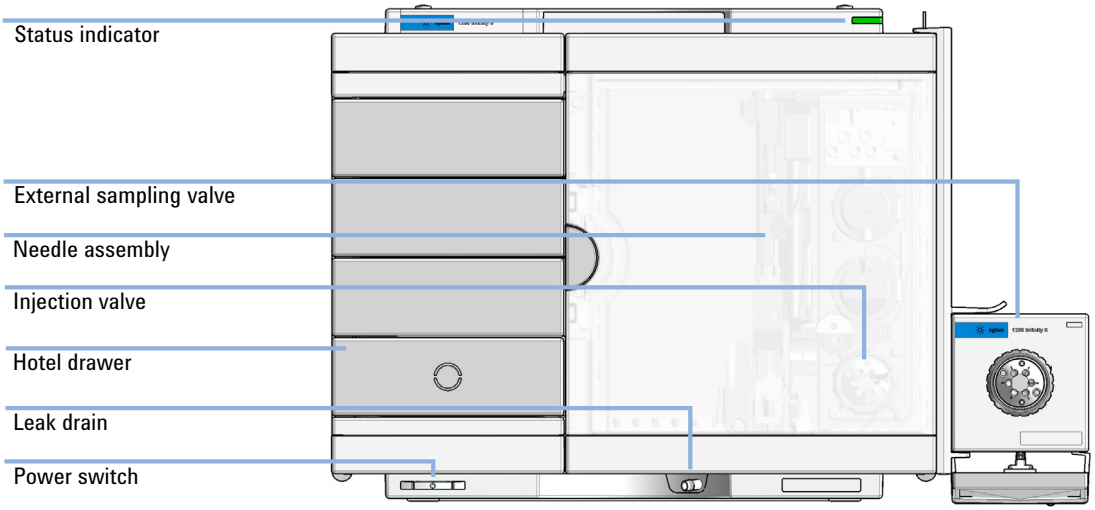


Figure 2 Overview of the Online Sample Manager Set modules

Universal Valve Drive G1170A

The Agilent 1290 Infinity II Valve Drive (G1170A) is an external valve drive that can be equipped with different valve heads. It comes with a flexible mounting bracket for left- or right-side mounting on LC stacks. The 1290 Infinity II Valve Drive is compatible with all currently available InfinityLab Quick Change Valve heads to allow maximum flexibility and a variety of applications.

In the 1260 Online Sample Manager, it is used with a special valve head (3-position/6-port FI) and serves as an external sampling interface. The external sampling interface is highly synchronized with the inner valve of the 1260 Online Sample Manager. It transfers the sample from the process stream into the 1260 Online Sample Manager and enables automated process monitoring.

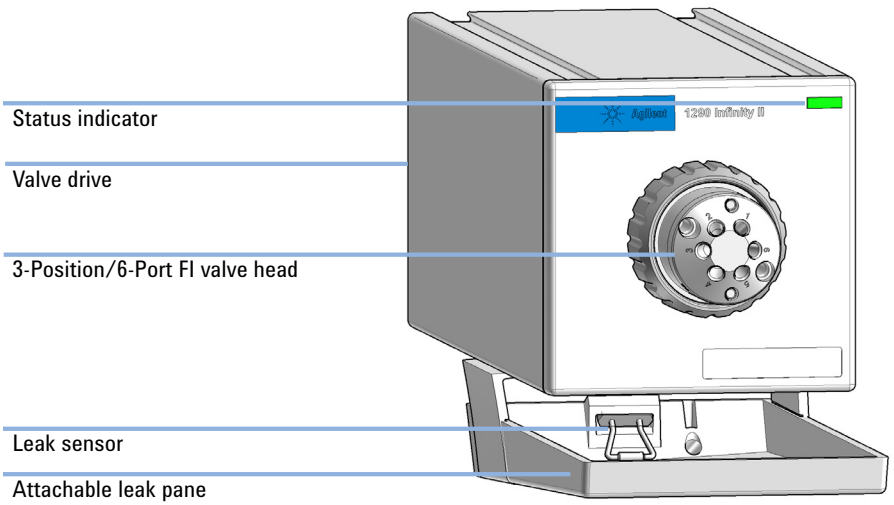


Figure 3 Overview of the External Sampling Valve

Multicolumn Thermostat G7116A

The Agilent 1260 Infinity II Multicolumn Thermostat (MCT) facilitates precise column thermostatting over a broad temperature range with cooling down to 10 °C below ambient temperature and heating up to 85 °C.

This capability provides robust and reliable separations for maximum application flexibility. Exchangeable high-pressure valves enable a wide range of applications such as column selection of up to four columns, sample preparation for analyte enrichment or matrix removal, or alternating column regeneration.

The MCT matches perfectly with all InfinityLab LC Series systems and can also be combined with 1290 Infinity II Series modules as well as with previous 1260 Infinity and 1290 Infinity Series modules.

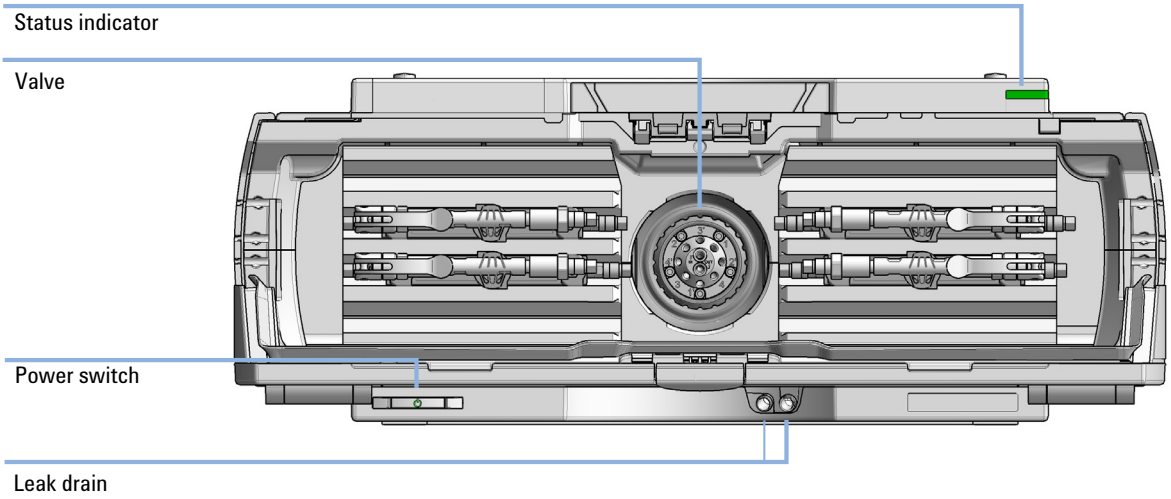


Figure 4 Overview of the Multicolumn Thermostat

Diode Array Detector WR G7115A

The Agilent 1260 Infinity II DAD WR detector is designed for highest optical performance, GLP compliance, and easy maintenance. With its 120 Hz data acquisition rate the detector is perfectly suited for fast LC applications. The long –life deuterium lamps allow highest intensity and lowest detection limits over a wavelength range of 190 – 950 nm. The use of RFID tags for all flow cells and UV-lamps provides traceable information about these assemblies.

The built-in holmium oxide filter features the fast wavelength accuracy verification, while the built-in temperature controls improves the baseline stability. Additional diagnostic signals for temperature and lamp voltage monitoring are available.

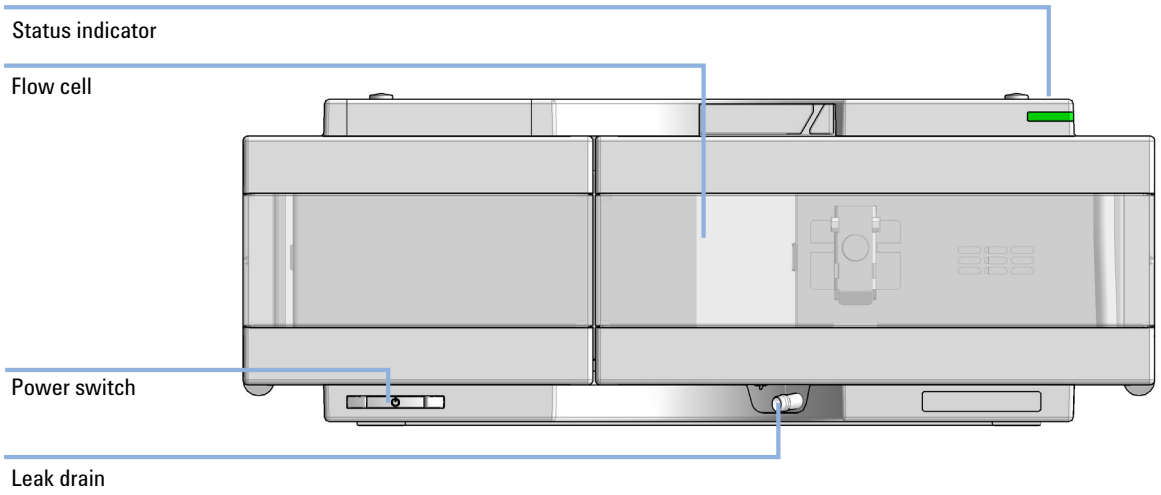


Figure 5 Overview of the detector

Variable Wavelength Detector G7114A

The Agilent 1260 Infinity II Variable Wavelength Detector (VWD) is the most sensitive and fastest detector in its class.

Time-programmable wavelength switching provides sensitivity and selectivity for your applications.

More sample information can be acquired in the dual wavelength mode.

Low detector noise (<±2.5 µAU) and baseline drift (<$1 \cdot 10^{-4}$ AU/h) facilitates precise quantification of trace levels components.

High productivity can be achieved with fast analysis at up to 120 Hz data rates.

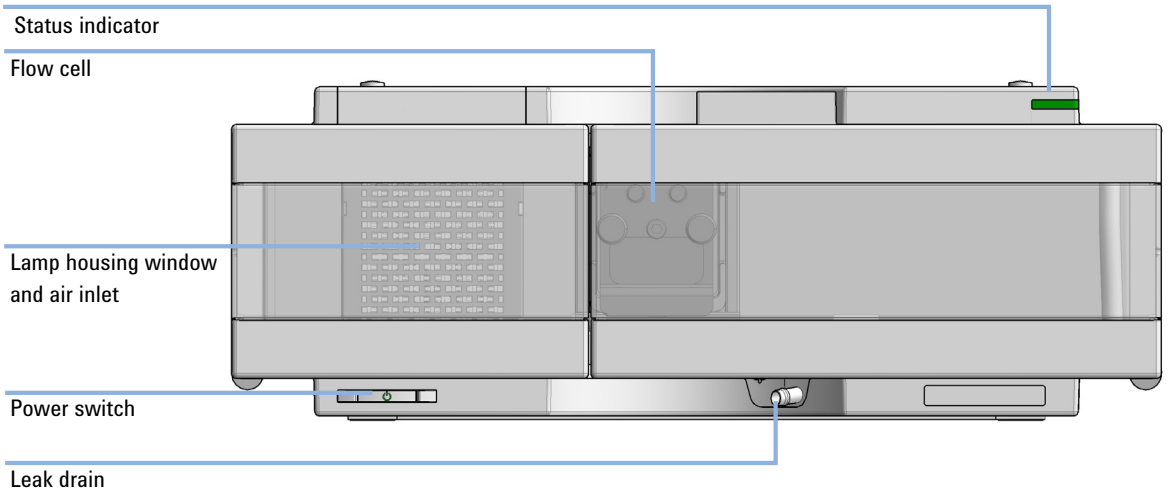


Figure 6 Overview of the detector

Refractive Index Detector G7162A

The Agilent 1260 Infinity II Refractive Index Detector (RID) is the ideal detector for fast and reliable LC results when routinely analyzing non-UV absorbing substances, such as carbohydrates, lipids, and polymers. The 1260 Infinity II RID is also the detector of choice for gel permeation chromatography (GPC) or size exclusion chromatography (SEC).

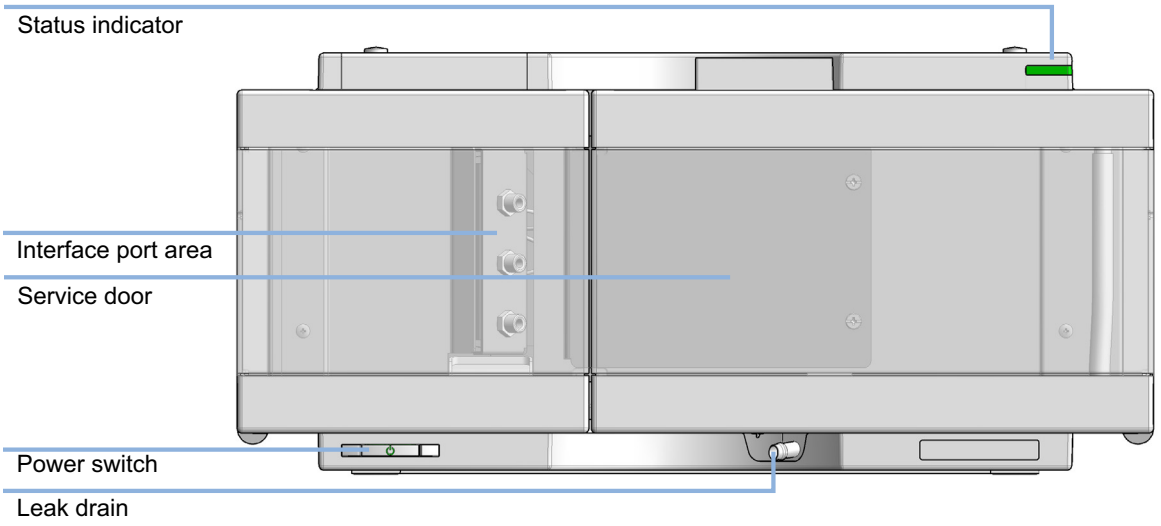


Figure 7 Overview of the detector

Fluorescence Detector G7121A

The proven optical and electronic design of the Agilent 1260 Infinity II Fluorescence Detector provides highest sensitivity for the analysis of trace-level components. Time-programmable excitation and emission wavelength switching allows you to optimize the detection sensitivity and selectivity for your specific applications. High-speed detection with up to 74 Hz data rates keeping you pace with the analysis speed of fast LC.

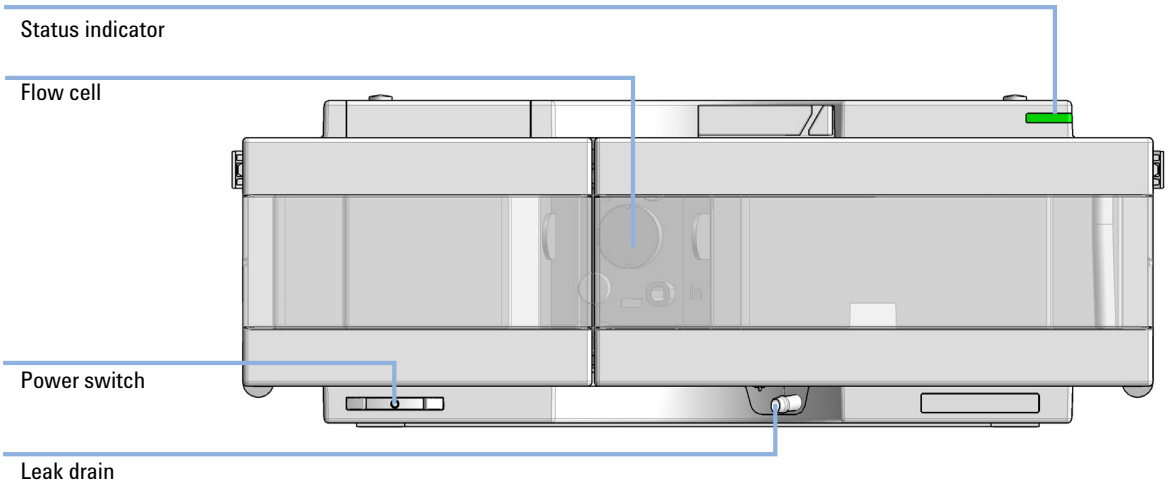


Figure 8 Overview of the detector

1290 Infinity II Bio Online LC System Components

The Agilent 1290 Infinity II Bio Online LC System consists of the following components:

- Agilent 1290 Infinity II Bio High-Speed Pump (G7132A) or 1290 Infinity II Bio Flexible Pump (G7131A).
- 1290 Infinity II Bio Online Sample Manager Set (G3167BA):
  - 1290 Infinity II Bio Online Sample Manager (G3167B)
  - External Sampling Valve: Universal Valve Drive (G1170A), equipped with a 3-position/6-port FI MP35N Valve
- Multicolumn Thermostat (G7116A/B) with Bio Heat Exchanger
- Diode Array Detector or Variable Wavelength Detector with corresponding/respective Bio flow cell
- Solvent Cabinet

The 1290 Infinity II Bio Online LC System is described in more detail in the following sections. The primary configuration choice of the modules is stacked on the InfinityLab FlexBench to ensure highest flexibility.

For specification, please see the individual module user documentation.

Bio High-Speed Pump (G7132A)

The Agilent 1290 Infinity II Bio High-Speed Pump is a binary UHPLC pump consisting of biocompatible material for use in biopharma and other applications utilizing high salt and extreme pH conditions. It uses high-pressure blending from up to two solvents at pressures up to 1300 bar and flow rates up to 5 mL/min.

The 1290 Infinity II Bio High-Speed Pump has an exceptionally low delay volume, achieving high throughput and highest resolution for the most demanding applications, giving you highest confidence in your results. It is the ideal front end for LC/MS applications.

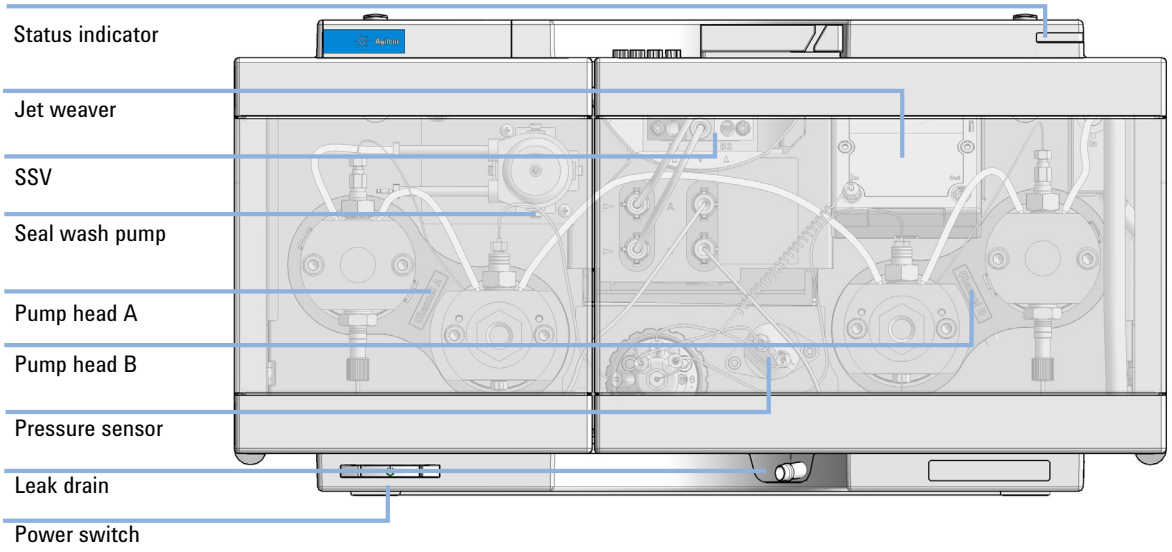


Figure 9 **Overview of the High-Speed Pump**

Bio Flexible Pump G7131A

The 1290 Infinity II Bio Flexible Pump is a UHPLC pump consisting of biocompatible material, designed for use in biopharma and other applications utilizing high-salt and extreme-pH conditions. It offers gradient formation from up to four solvents at pressures up to 1300 bar and flow rates up to 5 mL/min.

The 1290 Infinity II Bio Flexible Pump combines exceptional performance, method compatibility, and simplified operation with outstanding flexibility in automated gradient formation and solvent blending. Intelligent System Emulation Technology (ISET) allows you to seamlessly transfer existing methods from different instruments.

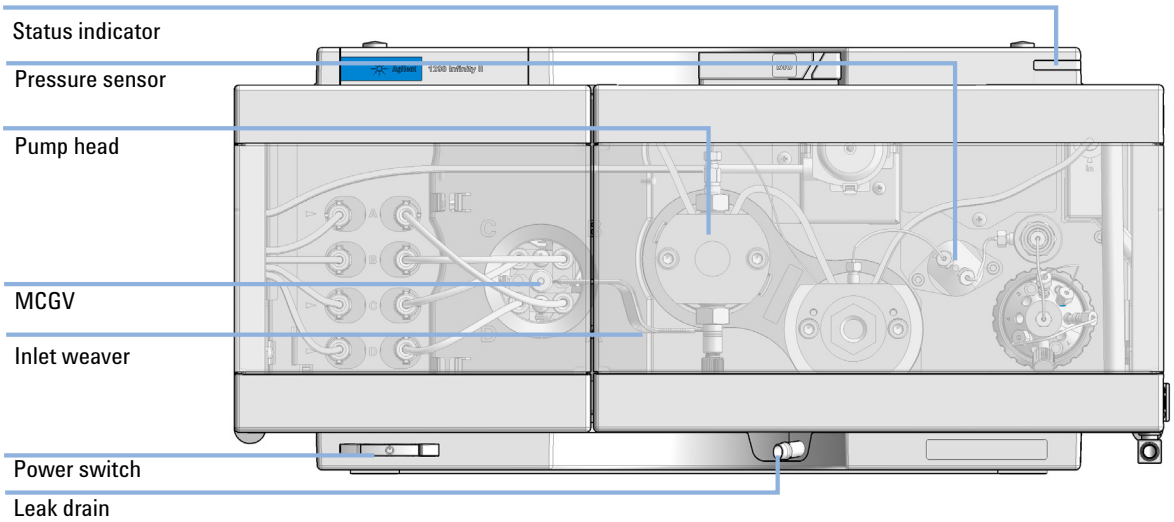


Figure 10 Overview of the Flexible Pump

Bio Online Sample Manager Set G3167BA

The Agilent 1290 Infinity II Bio Online Sample Manager Set (G3167BA) consists of the Agilent 1290 Infinity II Bio Online Sample Manager (G3167B) and the Agilent 1290 Infinity II Valve Drive (G1170A) with External Sampling Valve, see Figure 11 on page 22.

Bio Online Sample Manager G3167B

The 1290 Infinity II Bio Online Sample Manager combines the 1260 Infinity II Online Sample Manager and the 1290 Infinity II Bio Multisampler, offering a biocompatible flow path and a maximum pressure capability of 1300 bar, for the most demanding (bio-)process monitoring applications. The Online Sample Manager mediates sample diluent incompatibility in challenging (bio-)process samples by supporting both flow-through and Agilent Feed Injection methods. It automates dilutions up to 1:1000 and offers retain-sample functionality for further analysis. The system also enables direct analysis of process samples and provides automated sample preparation.

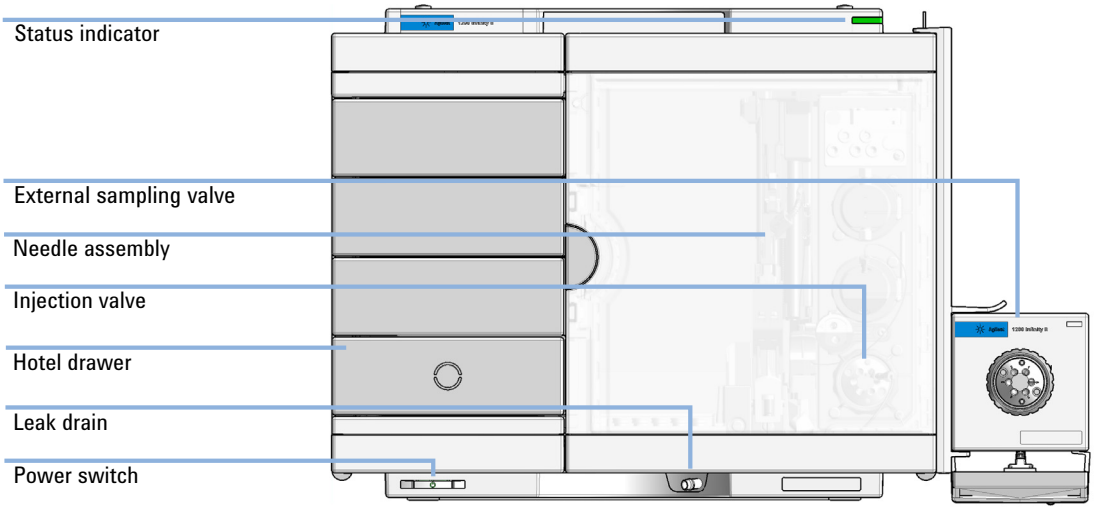


Figure 11 Overview of the Online Sample Manager Set modules

Universal Valve Drive G1170A

The Agilent 1290 Infinity II Valve Drive (G1170A) is an external valve drive that can be equipped with different valve heads. It comes with a flexible mounting bracket for left- or right-side mounting on LC stacks. The 1290 Infinity II Valve Drive is compatible with all currently available InfinityLab Quick Change Valve heads to allow maximum flexibility and a variety of applications.

In the 1290 Bio Online Sample Manager, it is used with a special valve head (3-position/6-port FI MP35N) and serves as an external sampling interface. The external sampling interface is highly synchronized with the inner valve of the 1290 Bio Online Sample Manager. It transfers the sample from the process stream into the 1290 Bio Online Sample Manager and enables automated process monitoring.

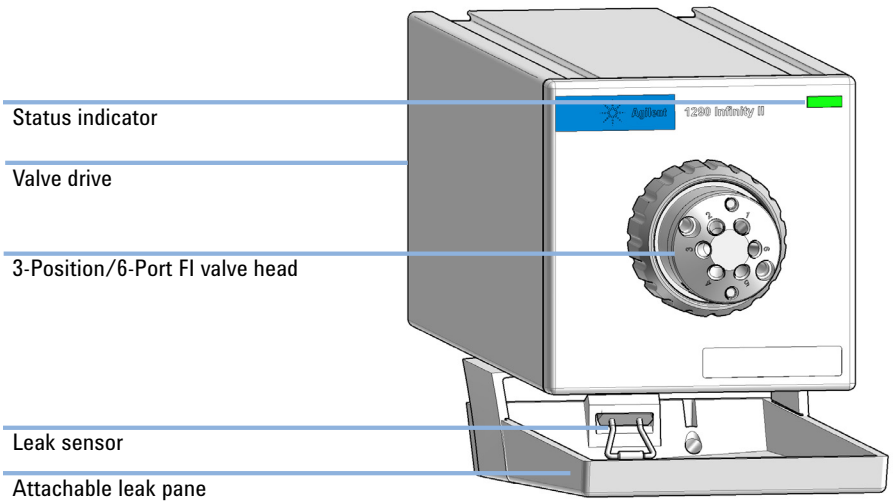


Figure 12 Overview of the External Sampling Valve

Multicolumn Thermostat with Bio Heat Exchangers

The Agilent 1290 Infinity II Multicolumn Thermostat (MCT) facilitates precise column thermostatting over a broad temperature range with cooling down to 20 °C below ambient temperature and heating up to 110 °C.

This capability provides high flexibility for optimized speed and enhanced selectivity of LC separations. Exchangeable ultra-high-pressure valves enable a wide range of applications such as column selection from eight columns in a single MCT, sample preparation for analyte enrichment or matrix removal, alternating column regeneration – and many more.

The MCT matches perfectly with all InfinityLab LC Series systems and can also be combined with previous 1260 and 1290 Infinity Series modules.

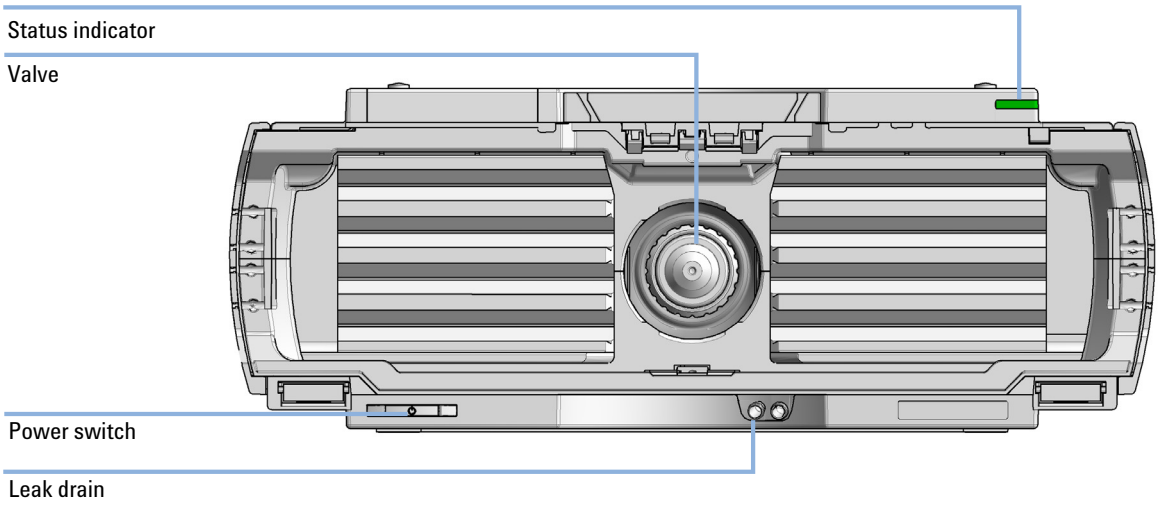


Figure 13 Overview of the Multicolumn Thermostat

Diode Array Detector FS with Bio Flow Cell

The Agilent 1290 Infinity II Diode Array Detector FS (fixed slit) is based on the Agilent Max-Light cartridge cell with optofluidic waveguides that improve light transmission to near 100% efficiency without sacrificing resolution caused by cell dispersions effects.

With typical detector noise levels of < ±0.6 µAU/cm the 60 mm flow cell gives up to 10 times higher sensitivity than detectors with conventional flow cells.

Any compromising refractive index and thermal effects are almost completely eliminated, resulting in significantly less baseline drift for more reliable and precise peak integration.

For fast separations, this detector has multiple wavelength and full spectral detection at sampling rates up to 120 Hz.

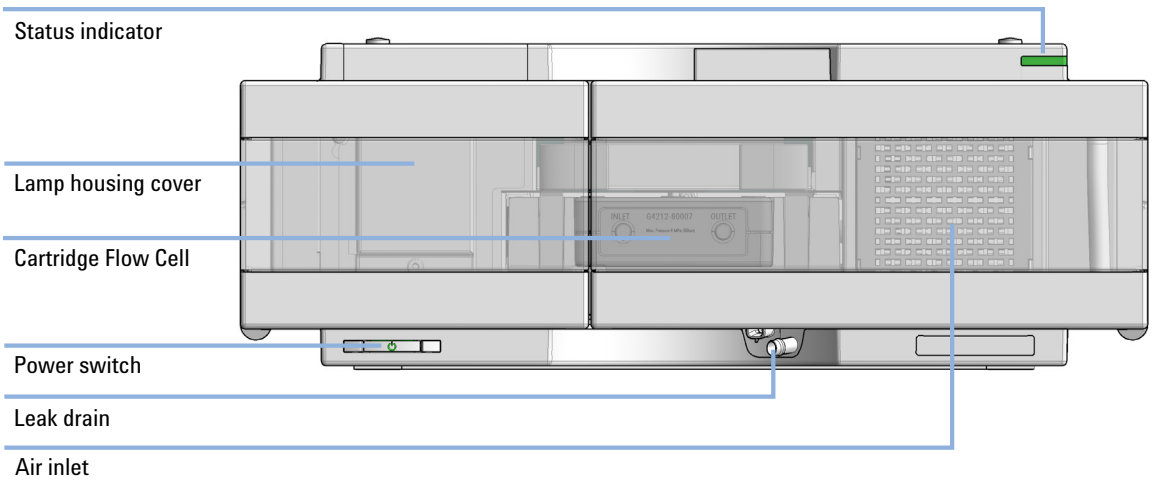


Figure 14 Overview of the detector

Diode Array Detector with Bio Flow Cell

The Agilent 1290 Infinity II Diode Array Detector (DAD) is based on the Agilent Max-Light cartridge cell with optofluidic waveguides that improve light transmission to near 100% efficiency without sacrificing resolution caused by cell dispersions effects.

With typical detector noise levels of < ±0.6 µAU/cm the 60 mm flow cell gives up to 10 times higher sensitivity than detectors with conventional flow cells.

Any compromising refractive index and thermal effects are almost completely eliminated, resulting in significantly less baseline drift for more reliable and precise peak integration.

For fast separations, this detector has multiple wavelength and full spectral detection at sampling rates up to 240 Hz.

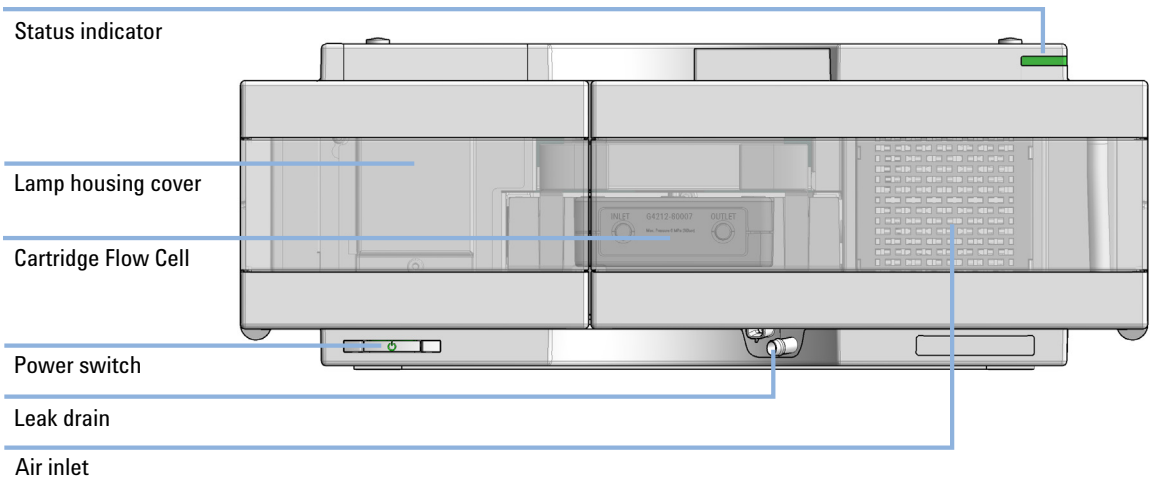


Figure 15 Overview of the detector

Variable Wavelength Detector with Bio Flow Cell

The Agilent 1290 Infinity II Variable Wavelength Detector (VWD) is the most sensitive and fastest detector in its class.

Time-programmable wavelength switching provides sensitivity and selectivity for your applications.

More sample information can be acquired in the dual wavelength mode.

Low detector noise (<±1.5 µAU) and baseline drift (<$1 \cdot 10^{-4}$ AU/h) facilitates precise quantification of trace levels components.

High productivity can be achieved with fast analysis at up to 240 Hz data rates.

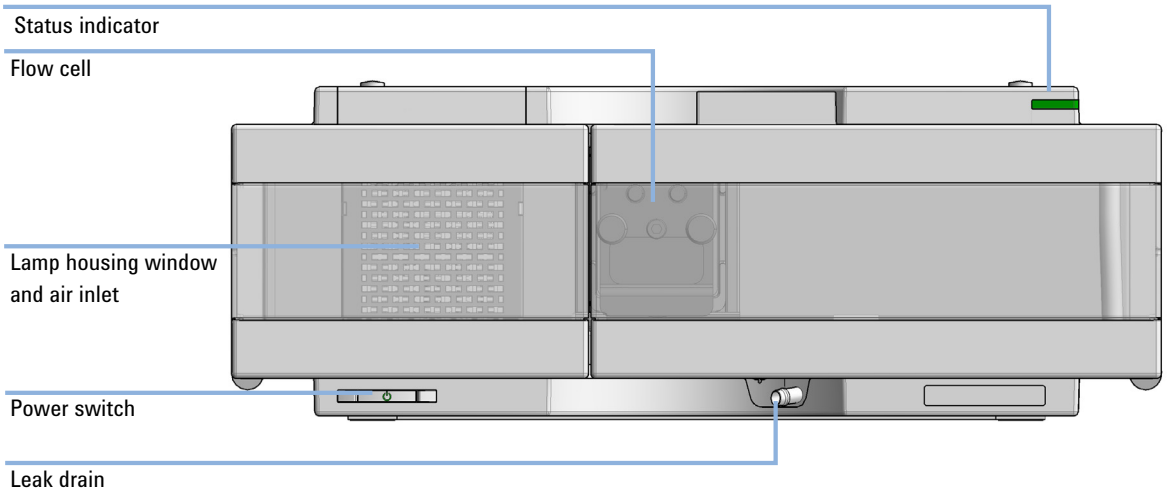


Figure 16 Overview of the detector

Bio Materials

For the 1290 Infinity II Bio LC System, Agilent Technologies uses highest-quality materials in the flow path (also referred to as wetted parts). Life scientists accept these materials, as they are known for optimum inertness to biological samples and ensure best compatibility with common samples and solvents over a wide pH range. To enable chromatography at very high pressures, while maintaining inertness the metal alloy MP35N is used instead of stainless steel throughout the system.

The MP35N is a nonmagnetic, nickel-cobalt-chromium-molybdenum alloy with an excellent resistance to sulfation, oxidation, saline solutions, and most mineral acids. Its superior properties guaranty reliable performance, even under UHPLC conditions.

Table 1 Used Biocompatible materials

Module	Materials
Agilent 1290 Infinity Bio High-Speed Pump (G7132A)	MP35N, gold, ceramic, ruby, PTFE, PEEK, UHMW-PE, tantalum, TFE/PDD copolymer, PFA, FEP, FFKM, ETFE, DLC coated MP35N
Agilent 1290 Infinity Bio Flexible Pump (G7131A)	MP35N, gold, ceramic, ruby, PEEK, UHMW-PE, tantalum, TFE/PDD copolymer, PFA, FEP, titanium, DLC coated MP35N, FFKM, ETFE
Agilent 1290 Infinity II Bio Online Sample Manager (G3167B)	PEEK, FFKM, titanium, PTFE, PPS, MP35N, gold, DLC coated MP35N, UHMW-PE
Biocompatible Flow Cells:	
Max-Light Cartridge Cell LSS (10 mm) (G7117-60020) (for Agilent 1290 Infinity II DAD (G7117A/B))	MP35N, fused silica, PEEK
Bio standard flow cell VWD, 10 mm, Cell Vol. 14 µl, Sapphire, MP35N (G1314-60188) (for Agilent 1290 Infinity II VWD (G7114B)	Sapphire, MP35N, FEP
Bio micro flow cell VWD, 3 mm, Cell Vol. 2 µl, Sapphire, MP35N (G1314-60189) (for Agilent 1290 Infinity II VWD (G7114B)	Sapphire, MP35N, FEP

Table 1 Used Biocompatible materials

Module	Materials
Biocompatible Heat Exchangers, Valves and Capillaries:	
Quick Connect Bio Heat Exchanger Standard Flow (G7116-60071), Quick Connect Bio Heat Exchanger High Flow (G7116-60081), Quick Connect Bio Heat Exchanger Ultra Low Dispersion (G7116-60091) (for Agilent 1290 Infinity II Multicolumn Thermostat (G7116B))	MP35N
2-position/10-port valve, bio 1300 bar (G5641A)	MP35N coated with DLC, PEEK
12-position/13-port solvent selection valve (G4235A)	PEEK, ceramic (Al_2O_3 based)
2-position/6-port valve, bio-inert (G5631A)	PEEK, ceramic
4 column selector valve kit, bio-inert (G5639A)	PEEK, ceramic
Bio connection capillaries	MP35N

NOTE

To ensure optimum biocompatibility of your Agilent 1290 Infinity II Bio LC System, do not include non-Bio standard modules or parts to the flow path. Do not use any parts that are not labeled as Agilent “Bio”. For solvent compatibility of these materials, see “General Information about Solvent/Material Compatibility” on page 30.

Solvent Information

Observe the following recommendations on the use of solvents.

- Follow the recommendations for avoiding the growth of algae, see the pump manuals.
- Small particles can permanently block capillaries and valves. Therefore, always filter solvents through 0.22 µm filters.
- Avoid or minimize the use of solvents that may corrode parts in the flow path. Consider specifications for the pH range given for different materials such as flow cells, valve materials etc. and recommendations in subsequent sections.

General Information about Solvent/Material Compatibility

Materials in the flow path are carefully selected based on Agilent's experiences in developing highest-quality instruments for HPLC analysis over several decades. These materials exhibit excellent robustness under typical HPLC conditions. For any special condition, please consult the material information section or contact Agilent.

Disclaimer

Subsequent data was collected from external resources and is meant as a reference. Agilent cannot guarantee the correctness and completeness of such information. Data is based on compatibility libraries, which are not specific for estimating the long-term life time under specific but highly variable conditions of UHPLC systems, solvents, solvent mixtures, and samples. Information also cannot be generalized due to catalytic effects of impurities like metal ions, complexing agents, oxygen etc. Apart from pure chemical corrosion, other effects like electro corrosion, electrostatic charging (especially for nonconductive organic solvents), swelling of polymer parts etc. need to be considered. Most data available refers to room temperature (typically 20 – 25 °C, 68 – 77 °F). If corrosion is possible, it usually accelerates at higher temperatures. If in doubt, please consult technical literature on chemical compatibility of materials.

MP35N

MP35N is a nonmagnetic, nickel-cobalt-chromium-molybdenum alloy demonstrating excellent corrosion resistance (for example, against nitric and sulfuric acids, sodium hydroxide, and seawater) over a wide range of concentrations and temperatures. In addition, this alloy shows exceptional resistance to high-temperature oxidation. Due to excellent chemical resistance and toughness, the alloy is used in diverse applications: dental products, medical devices, nonmagnetic electrical components, chemical and food processing equipment, marine equipment. Treatment of MP35N alloy samples with 10 % NaCl in HCl (pH 2.0) does not reveal any detectable corrosion. MP35N also demonstrates excellent corrosion resistance in a humid environment. Although the influence of a broad variety of solvents and conditions has been tested, users should keep in mind that multiple factors can affect corrosion rates, such as temperature, concentration, pH, impurities, stress, surface finish, and dissimilar metal contacts.

Polyphenylene Sulfide (PPS)

Polyphenylene sulfide has outstanding stability even at elevated temperatures. It is resistant to dilute solutions of most inorganic acids, but it can be attacked by some organic compounds and oxidizing reagents. Nonoxidizing inorganic acids, such as sulfuric acid and phosphoric acid, have little effect on polyphenylene sulfide, but at high concentrations and temperatures, they can still cause material damage. Nonoxidizing organic chemicals generally have little effect on polyphenylene sulfide stability, but amines, aromatic compounds, and halogenated compounds may cause some swelling and softening over extended periods of time at elevated temperatures. Strong oxidizing acids, such as nitric acid (> 0.1 %), hydrogen halides (> 0.1 %), peroxy acids (> 1 %), or chlorosulfuric acid degrade polyphenylene sulfide. It is not recommended to use polyphenylene sulfide with oxidizing material, such as sodium hypochlorite and hydrogen peroxide. However, under mild environmental conditions, at low concentrations and for short exposure times, polyphenylene sulfide can withstand these chemicals, for example, as ingredients of common disinfectant solutions.

PEEK

PEEK (Polyether-Ether Ketones) combines excellent properties regarding biocompatibility, chemical resistance, mechanical and thermal stability. PEEK is therefore the material of choice for UHPLC and biochemical instrumentation.

It is stable in the specified pH range (for the Bio-Inert LC system: pH 1 – 13, see bio-inert module manuals for details), and inert to many common solvents.

There are still some known incompatibilities with chemicals such as chloroform, methylene chloride, THF, DMSO, strong acids (nitric acid > 10 %, sulfuric acid > 10 %, sulfonic acids, trichloroacetic acid), halogens or aqueous halogen solutions, phenol and derivatives (cresols, salicylic acid, and so on).

When used above room temperature, PEEK is sensitive to bases and various organic solvents, which can cause it to swell. Under such conditions, normal PEEK capillaries are sensitive to high pressure. Therefore, Agilent uses stainless steel clad PEEK capillaries in bio-inert systems. The use of stainless steel clad PEEK capillaries keeps the flow path free of steel and ensures pressure stability up to 600 bar. If in doubt, consult the available literature about the chemical compatibility of PEEK.

Polyimide

Agilent uses semi-crystalline polyimide for rotor seals in valves and needle seats in autosamplers. One supplier of polyimide is DuPont, which brands polyimide as Vespel, which is also used by Agilent.

Polyimide is stable in a pH range between 1 and 10 and in most organic solvents. It is incompatible with concentrated mineral acids (e.g. sulphuric acid), glacial acetic acid, DMSO and THF. It is also degraded by nucleophilic substances like ammonia (e.g. ammonium salts in basic conditions) or acetates.

Polyethylene (PE)

Agilent uses UHMW (ultra-high molecular weight)-PE/PTFE blends for yellow piston and wash seals, which are used in 1290 Infinity pumps, 1290 Infinity II pumps, the G7104C and for normal phase applications in 1260 Infinity pumps.

Polyethylene has a good stability for most common inorganic solvents including acids and bases in a pH range of 1 to 12.5. It is compatible with many organic solvents used in chromatographic systems like methanol, acetonitrile and isopropanol. It has limited stability with aliphatic, aromatic and halogenated hydrocarbons, THF, phenol and derivatives, concentrated acids and bases. For normal phase applications, the maximum pressure should be limited to 200 bar.

Tantalum (Ta)

Tantalum is inert to most common HPLC solvents and almost all acids except fluoric acid and acids with free sulfur trioxide. It can be corroded by strong bases (e.g. hydroxide solutions > 10 %, diethylamine). It is not recommended for the use with fluoric acid and fluorides.

Stainless Steel (SST)

Stainless steel is inert against many common solvents. It is stable in the presence of acids and bases in a pH range of 1 to 12.5. It can be corroded by acids below pH 2.3. It can also corrode in following solvents:

- Solutions of alkali halides, their respective acids (for example, lithium iodide, potassium chloride) and aqueous solutions of halogens.
- High concentrations of inorganic acids like nitric acid, sulfuric acid, and organic solvents especially at higher temperatures (replace, if your chromatography method allows, by phosphoric acid or phosphate buffer, which are less corrosive against stainless steel).
- Halogenated solvents or mixtures, which form radicals and/or acids, for example:

  $2\ CHCl_3 + O_2 \rightarrow 2\ COCl_2 + 2\ HCl$

  This reaction, in which stainless steel probably acts as a catalyst, occurs quickly with dried chloroform if the drying process removes the stabilizing alcohol.
- Chromatographic grade ethers, which can contain peroxides (for example, THF, dioxane, diisopropyl ether). Such ethers should be filtered through dry aluminum oxide, which adsorbs the peroxides.
- Solutions of organic acids (acetic acid, formic acid, and so on) in organic solvents. For example, a 1 % solution of acetic acid in methanol will attack steel.
- Solutions containing strong complexing agents (for example, EDTA, ethylenediaminetetraacetic acid).
- Mixtures of carbon tetrachloride with isopropanol or THF.

Titanium (Ti)

Titanium is highly resistant to oxidizing acids (for example, nitric, perchloric and hypochlorous acid) over a wide range of concentrations and temperatures. This is due to a thin oxide layer on the surface, which is stabilized by oxidizing compounds. Non-oxidizing acids (for example, hydrochloric, sulfuric and phosphoric acid) can cause slight corrosion, which increases with acid concentration and temperature. For example, the corrosion rate with 3 % HCl (about pH 0.1) at room temperature is about 13 µm/year. At room temperature, titanium is resistant to concentrations of about 5 % sulfuric acid (about pH 0.3). Addition of nitric acid to hydrochloric or sulfuric acids significantly reduces corrosion rates. Titanium is sensitive to acidic metal chlorides like $FeCl_3$ or $CuCl_2$. Titanium is subject to corrosion in anhydrous methanol, which can be avoided by adding a small amount of water (about 3 %). Slight corrosion is possible with ammonia > 10 %.

Diamond-Like Carbon (DLC)

Diamond-Like Carbon is inert to almost all common acids, bases, and solvents. There are no documented incompatibilities for HPLC applications.

Fused silica and Quartz (SiO_2)

Fused silica is used in Max Light Cartridges. Quartz is used for classical flow cell windows. It is inert against all common solvents and acids except hydrofluoric acid and acidic solvents containing fluorides. It is corroded by strong bases and should not be used above pH 12 at room temperature. The corrosion of flow cell windows can negatively affect measurement results. For a pH greater than 12, the use of flow cells with sapphire windows is recommended.

Gold

Gold is inert to all common HPLC solvents, acids, and bases within the specified pH range. It can be corroded by complexing cyanides and concentrated acids like aqua regia.

Zirconium Oxide (ZrO_2)

Zirconium Oxide is inert to almost all common acids, bases, and solvents. There are no documented incompatibilities for HPLC applications.

Platinum/Iridium

Platinum/Iridium is inert to almost all common acids, bases, and solvents. There are no documented incompatibilities for HPLC applications.

Fluorinated polymers (PTFE, PFA, FEP, FFKM, PVDF)

Fluorinated polymers like PTFE (polytetrafluorethylene), PFA (perfluoroalkoxy), and FEP (fluorinated ethylene propylene) are inert to almost all common acids, bases, and solvents. FFKM is perfluorinated rubber, which is also resistant to most chemicals. As an elastomer, it may swell in some organic solvents like halogenated hydrocarbons.

TFE/PDD copolymer tubings, which are used in all Agilent degassers except G1322A/G7122A, are not compatible with fluorinated solvents like Freon, Fluorinert, or Vertrel. They have limited life time in the presence of hexafluoroisopropanol (HFIP). To ensure the longest possible life with HFIP, it is best to dedicate a particular chamber to this solvent, not to switch solvents, and not to let dry out the chamber. For optimizing the life of the pressure sensor, do not leave HFIP in the chamber when the unit is off.

The tubing of the leak sensor is made of PVDF (polyvinylidene fluoride), which is incompatible with the solvent DMF (dimethylformamide).

Sapphire, Ruby, and Al_2O_3-based ceramics

Sapphire, ruby, and ceramics based on aluminum oxide Al_2O_3 are inert to almost all common acids, bases, and solvents. There are no documented incompatibilities for HPLC applications.

Flow Cell

To protect optimal functionality of your flow cell:

- If the flow cell is transported while temperatures are below 5 °C, it must be ensured that the cell is filled with alcohol to avoid damage by freezing water.
- Aqueous solvents in the flow cell can build up algae. Therefore, do not leave aqueous solvents sitting in the flow cell. Add a small percentage of organic solvents (for example, about 5 % of acetonitrile or methanol).

Optimizing the Stack Configuration

To ensure safe operation and optimum performance of an Agilent InfinityLab Online LC System, Agilent Technologies prescribe stack configurations.

The following configurations are possible:

- InfinityLab Flex Bench, providing highest flexibility
- InfinityLab Benchtop
- One Stack (maximal 4 modules, in a bench rack or directly on the bench)
- Two Stacks (in a bench rack or directly on the bench)

The table below summarizes the advantages of the different prescribed configurations.

Table 2 Overview on pros and cons of different stack configurations

Modules in a stack	InfinityLab Flex Bench Configuration	Single Stack Configuration	Two Stacks Configuration
fewer than 5	**Pros** • no bench required • mobile • optimal access to the modules, solvent bottles, pumps, columns, and accessories • integrated waste concept	**Pros** • minimal bench space required **Cons** • high stack	**Pros** • lower stacks • flexible combinations **Cons** • maximum bench space required
5 and more	+ possible	- not possible	+ possible

InfinityLab Flex Bench Configuration

Agilent recommends to use the InfinityLab Flex Bench for all Agilent LC systems.

Main features:

- Increases flexibility in the lab
- Safe moving of LC
- Easy stack customization
- Included waste management

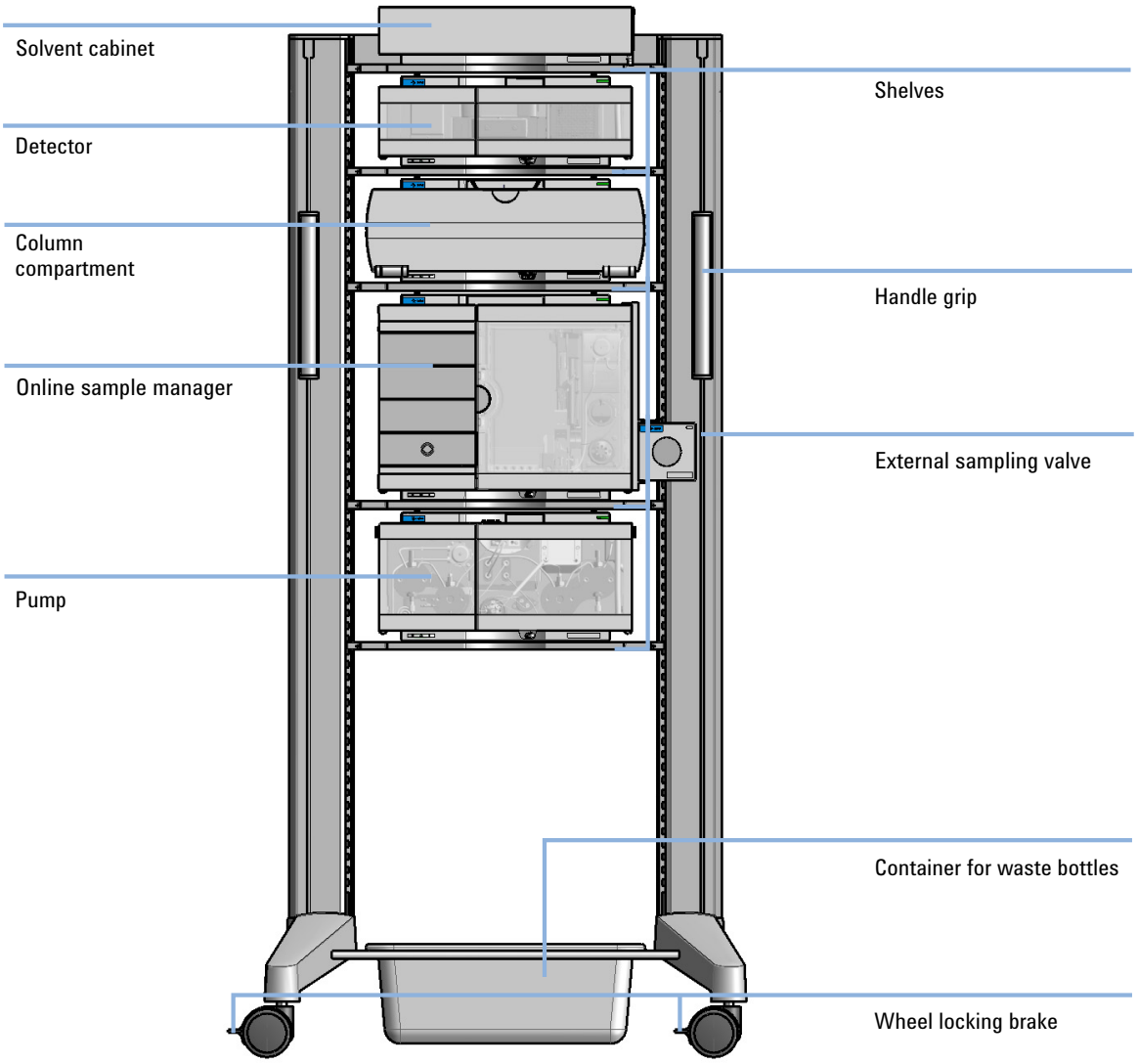


Figure 17 Flex Bench Online LC System Configuration

InfinityLab Benchtop Configuration

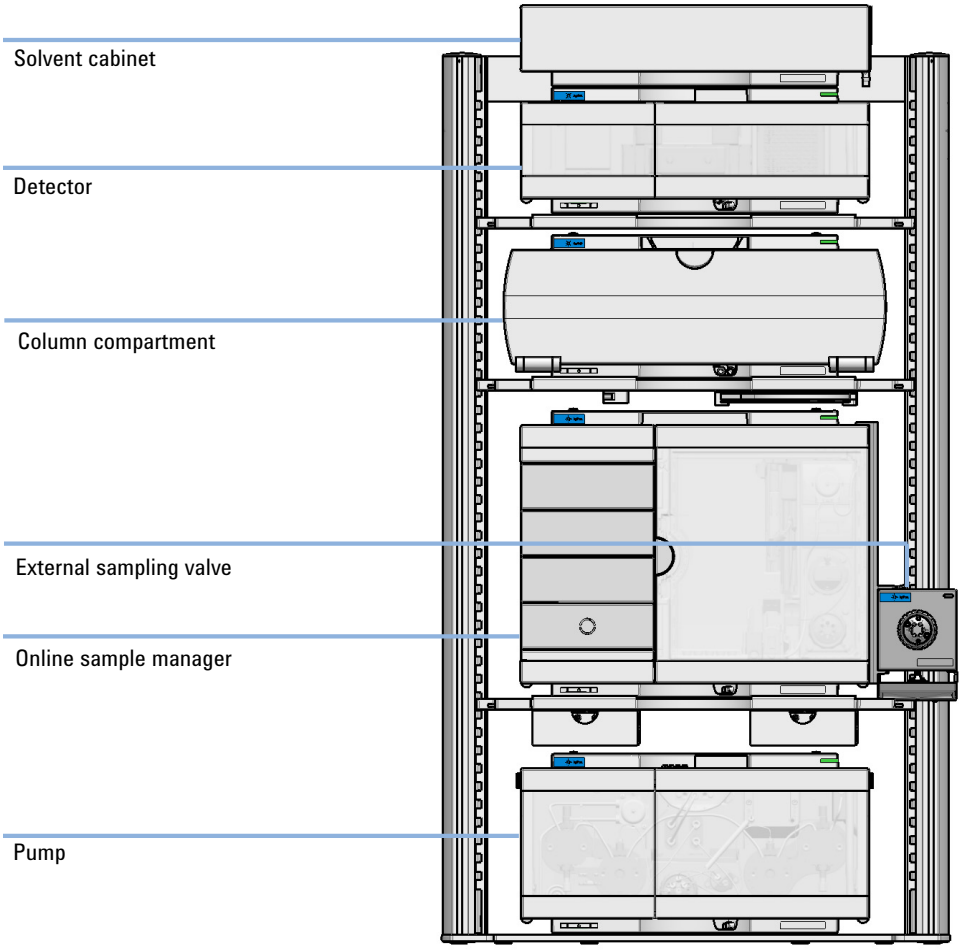


Figure 18 Benchtop Online LC System Configuration

Online LC System Stack Configurations

One Stack Configuration

Ensure optimum performance by stacking the modules as shown exemplarily in One stack configuration. This configuration optimizes the flow path for minimum delay volume and minimizes the bench space required (Figure 19 on page 39).

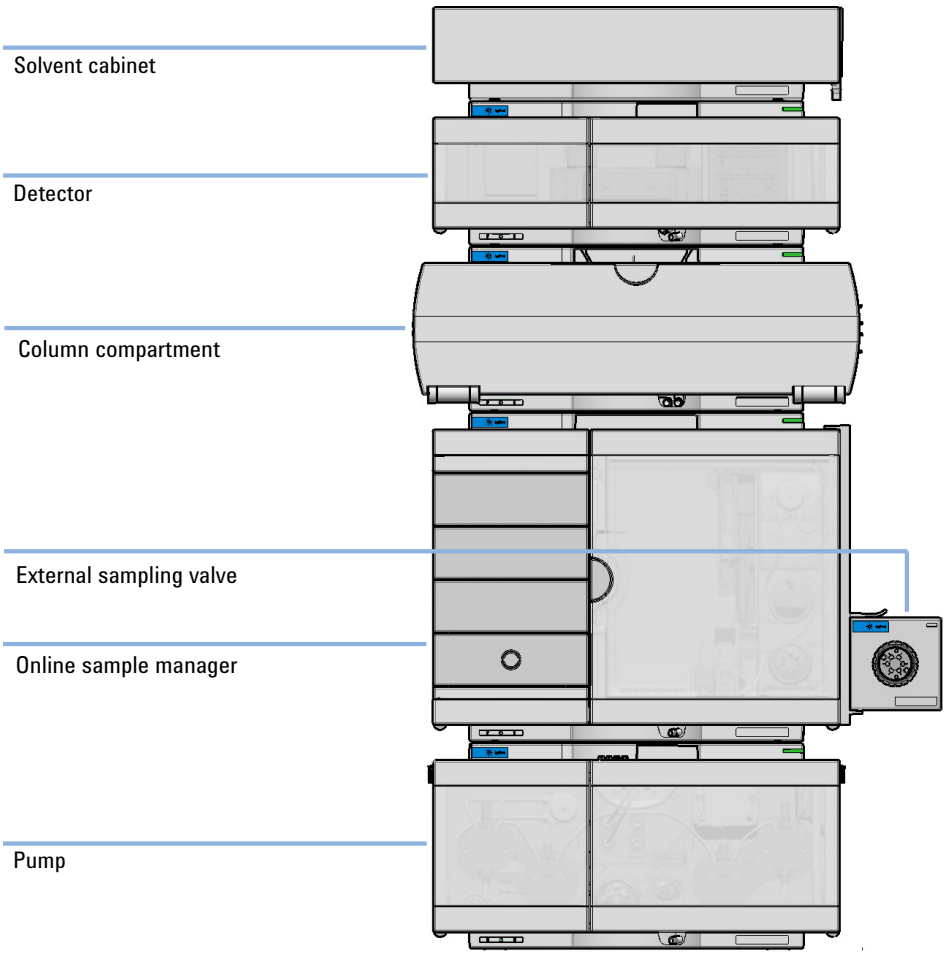


Figure 19 One Stack Online LC System Configuration

Two Stack Configuration

To avoid excessive height of the stack (for example when using the system in combination with an additional detector) it is recommended to form two stacks.

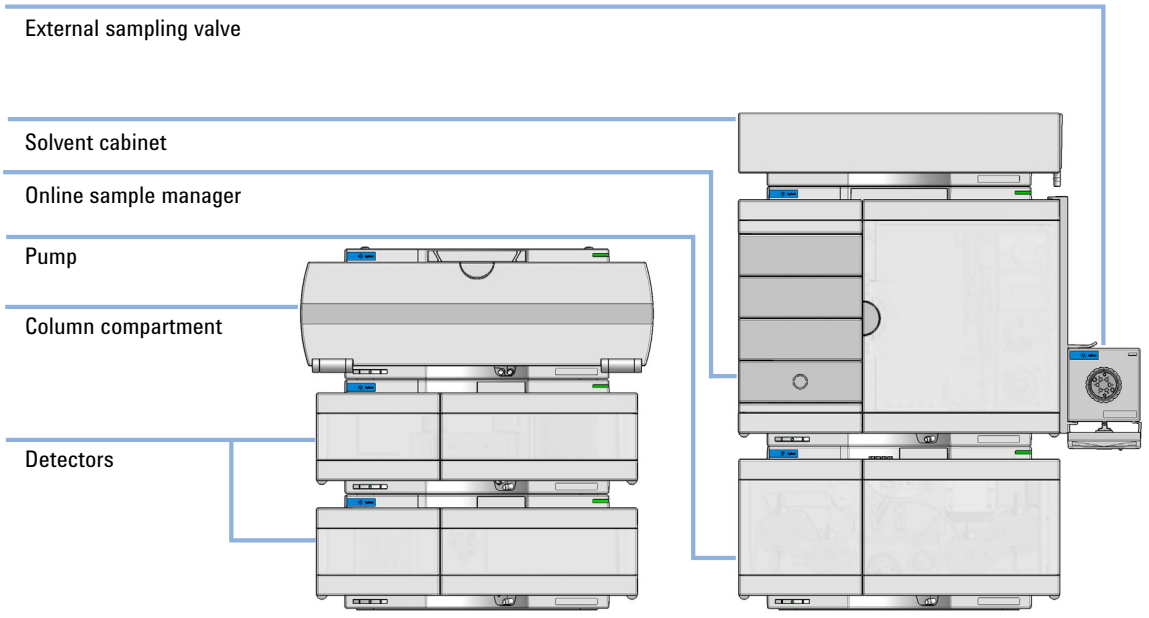


Figure 20 Two Stack Online LC System Configuration

Leak and Waste Handling

The Agilent InfinityLab Online LC System has been designed for safe leak and waste handling. It is important that all security concepts are understood and instructions are carefully followed.

The solvent cabinet is designed to store a maximum volume of 8 L solvent. The maximum volume for an individual bottle stored in the solvent cabinet should not exceed 2 L. For details, see the usage guideline for the Agilent Infinity II Solvent Cabinets (a printed copy of the guideline has been shipped with the solvent cabinet, electronic copies are available on the Internet).

All leak plane outlets are situated in a consistent position so that all Infinity and Infinity II modules can be stacked on top of each other. Waste tubes are guided through a channel on the right hand side of the instrument, keeping the front access clear from tubes.

The leak plane provides leak management by catching all internal liquid leaks, guiding them to the leak sensor for leak detection, and passing them on to the next module below, if the leak sensor fails. The leak sensor in the leak plane stops the running system as soon as the leak detection level is reached.

Solvent and condensate is guided through the waste channel into the waste container:

- from the detector's flow cell outlet
- from the Online Sample Manager needle wash port
- from the Sample Cooler or Sample Thermostat (condensate)
- from the pump's Seal Wash Sensor (if applicable)
- from the pump's Purge Valve or Multipurpose Valve
- from the External Sampling Valve's leak pane

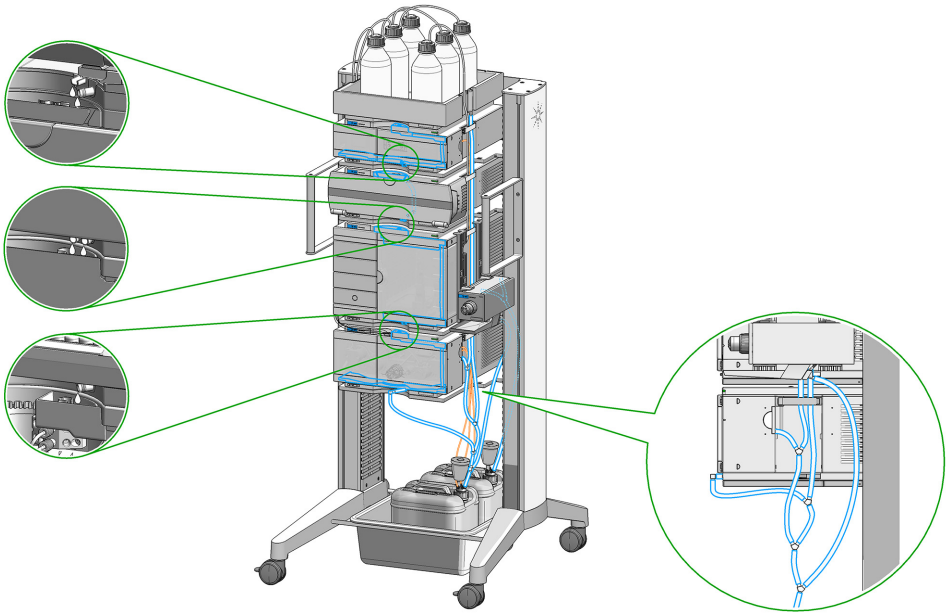


Figure 21 Online LC System Leak Waste Concept (Flex Bench installation)

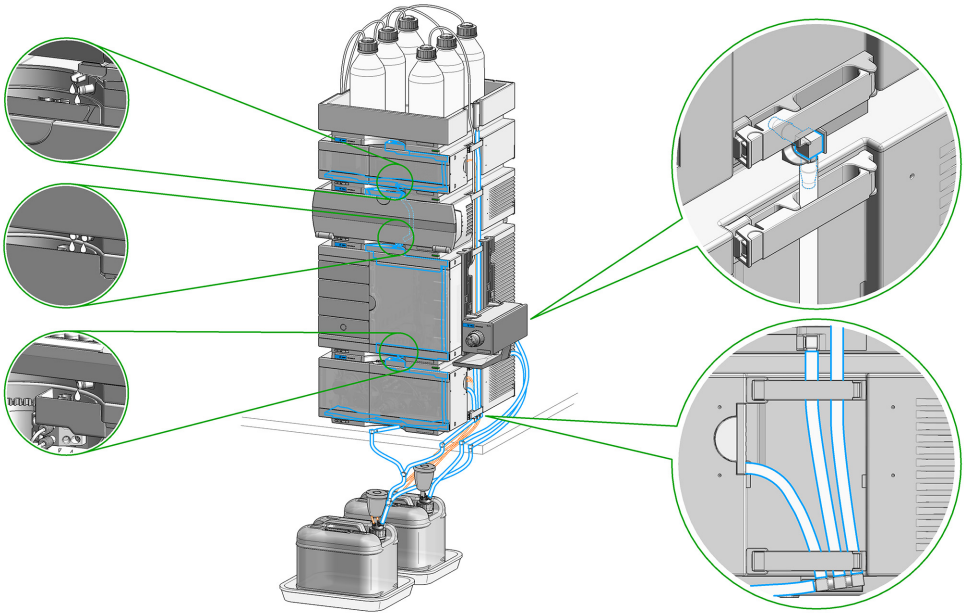


Figure 22 Online LC System One Stack Leak Waste Concept (bench installation)

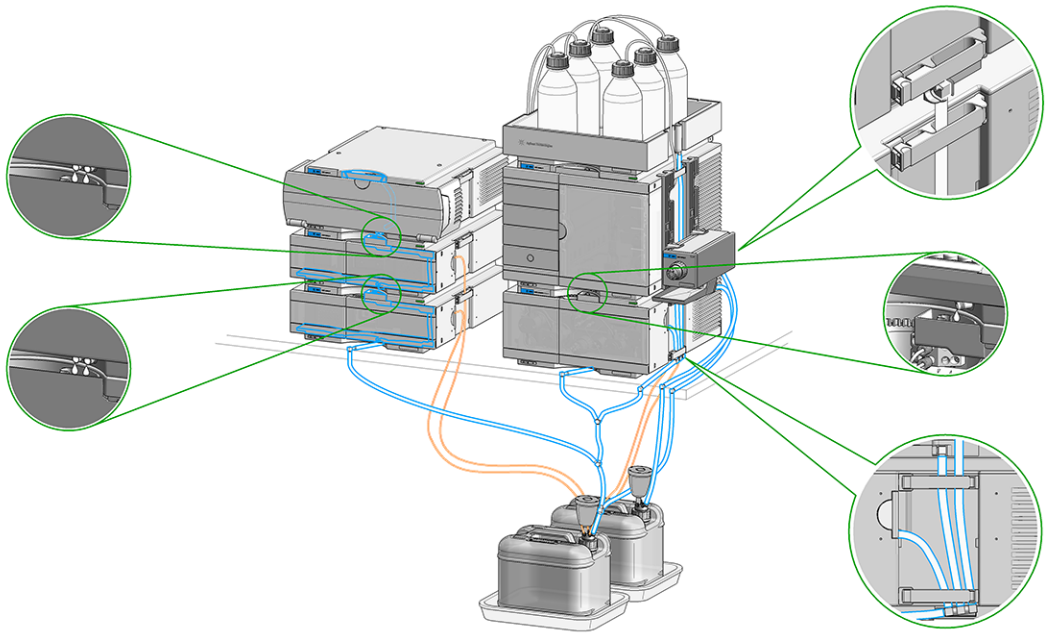
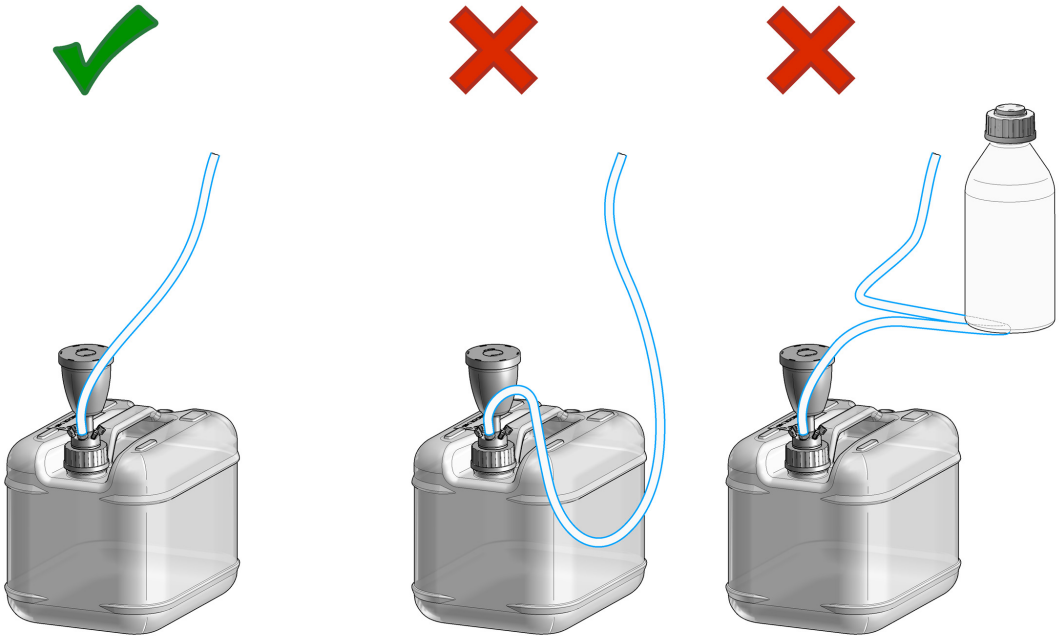


Figure 23 Online LC System Two Stack Leak Waste Concept (bench installation)

The waste tube connected to the leak pane outlet on each of the bottom instruments guides the solvent to a suitable waste container.

Waste Guidance



NOTE

The waste drainage must go straight into the waste containers. The waste flow must not be restricted at bends or joints.

Waste Concept

1 Agilent recommends using the 6 L waste can with 1 Stay Safe cap GL45 with 4 ports (5043-1221) for optimal and safe waste disposal. If you decide to use your own waste solution, make sure that the tubes don't immerse in the liquid.

2 Configuration Settings

This chapter describes how to configure the system.

General Information on LAN Configuration

LAN configuration is executed from the module with direct LAN connection to the controller software. This must be the module (usually the detector) with the highest data rate.

Hardware Configuration Settings

Example shows an instrument configuration with a Diode Array Detector.

1 Set the switches of the Configuration switch at the rear of the module:

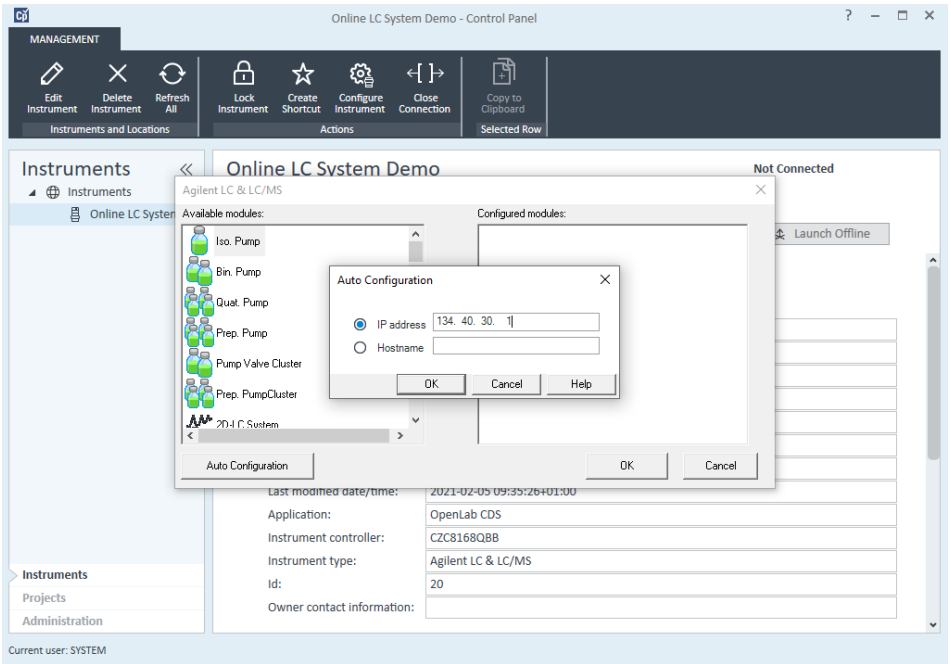
   a All switches DOWN: module uses the default IP address 192.168.254.11.

   b Switch 4 UP and others DOWN: module uses DHCP.

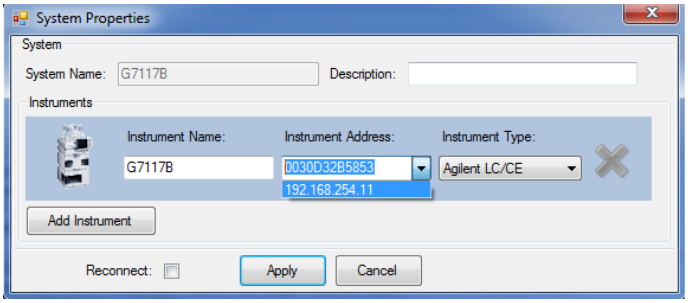
   c Switch 5 UP and others DOWN: modules uses STORED address.

2 Enter the setup information (MAC[1] / IP address and/or Instrument Name).

a Agilent OpenLab CDS (Configure Instrument):



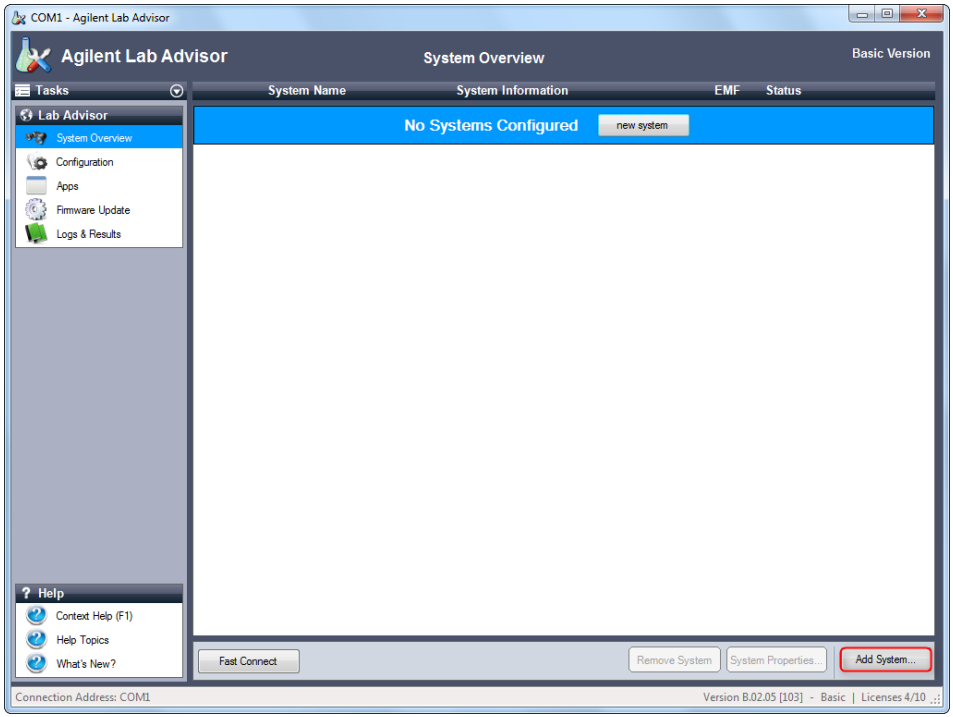
b Lab Advisor (Instrument Overview - Add Instrument):



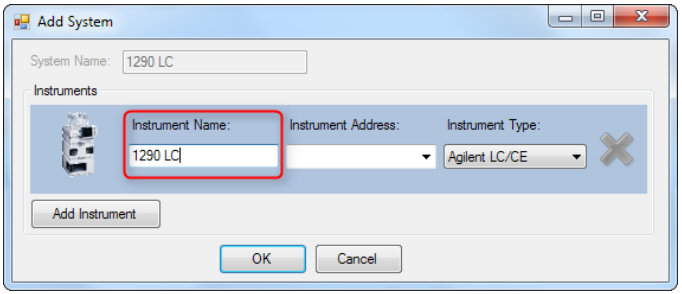
[1] MAC address can only be used in DHCP DIP-switch configuration.

Lab Advisor

1 In the Action Panel of the **System Overview**, click **Add System**.



The **Add System** dialog box is displayed.

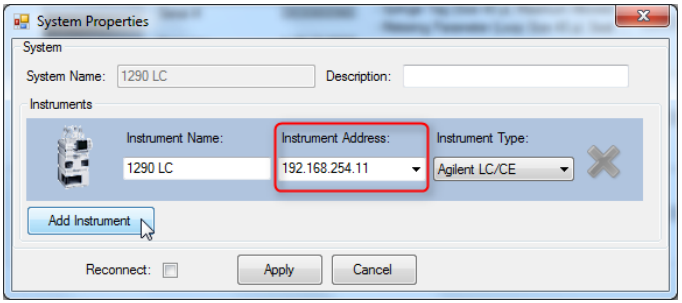


2 Enter a name in the **Instrument Name** field.

NOTE

If your system comprises just one instrument, the **Instrument Name** is copied to the **System Name** field.

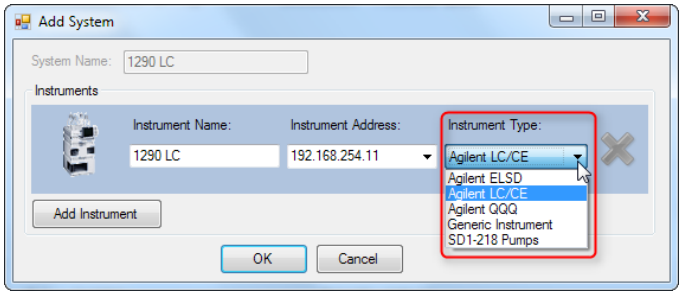
3 Enter the connection details in the **Instrument Address** field.



NOTE

The **Instrument Address** can be an IP address, the host name or, if you are connecting using a serial cable, the COM port.

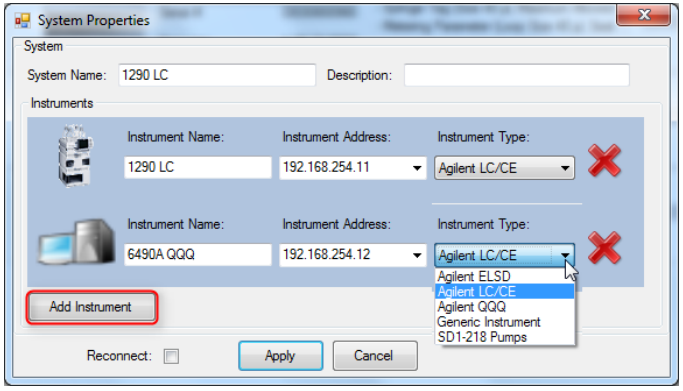
4 Click the **Instrument Type** down-arrow and select the type of instrument you are adding from the list. The default setting is **Agilent LC/CE**. Additional instrument types become available when the respective add-ons are installed.



NOTE

By default, the **Instrument Type** drop-down list contains only the entry **Agilent LC/CE**. Addition instrument types can be added by installing the respective add-ons (see "Installing Add-ons" on page 55).

5 If your system comprises more than one instrument, click **Add Instrument** and complete the details as above.

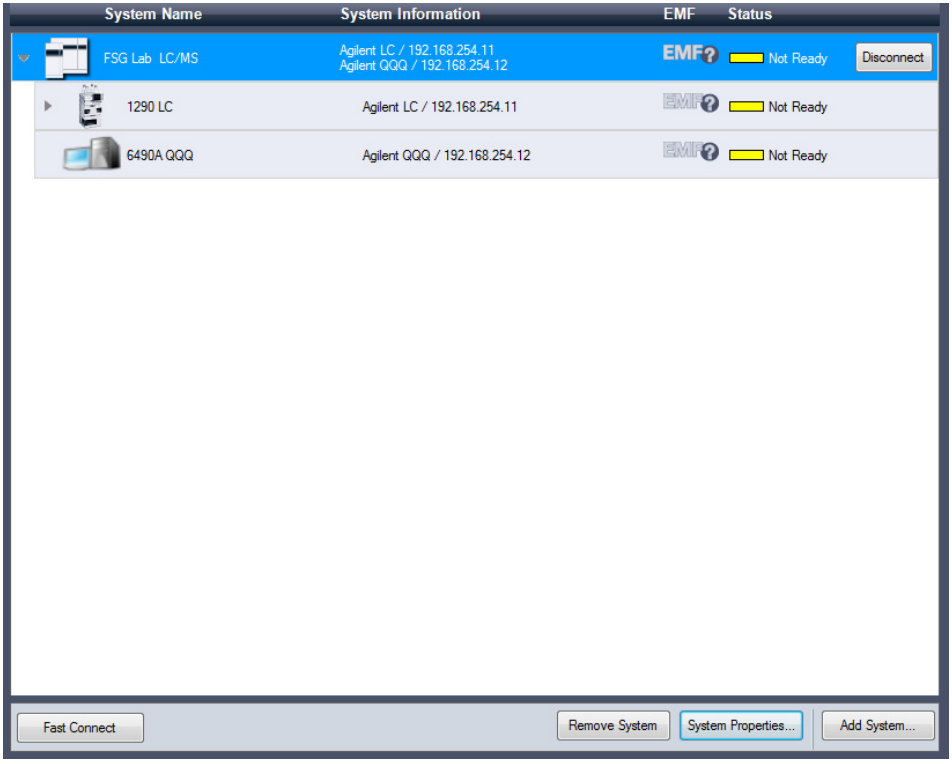


NOTE

As soon as you add a second instrument, the **System Name** field is activated to allow you to edit the system name.

6 Click **OK** to finish adding the system and close the **Add System** dialog box.

The system becomes visible in the **System Overview**, and Lab Advisor tries to connect to it.



Installing Add-ons

Add-ons are installed from the **Configuration** screen, using a Lab Advisor Extension file with the with the extension.LAX.

NOTE You need Administrator rights in order to install Add-ons.

1 In the Global Tasks section of the Navigation Panel, click **Configuration**.
The **Configuration** screen is displayed.

2 Click **Add-ons** to navigate to the **Configuration - Add-ons** screen.

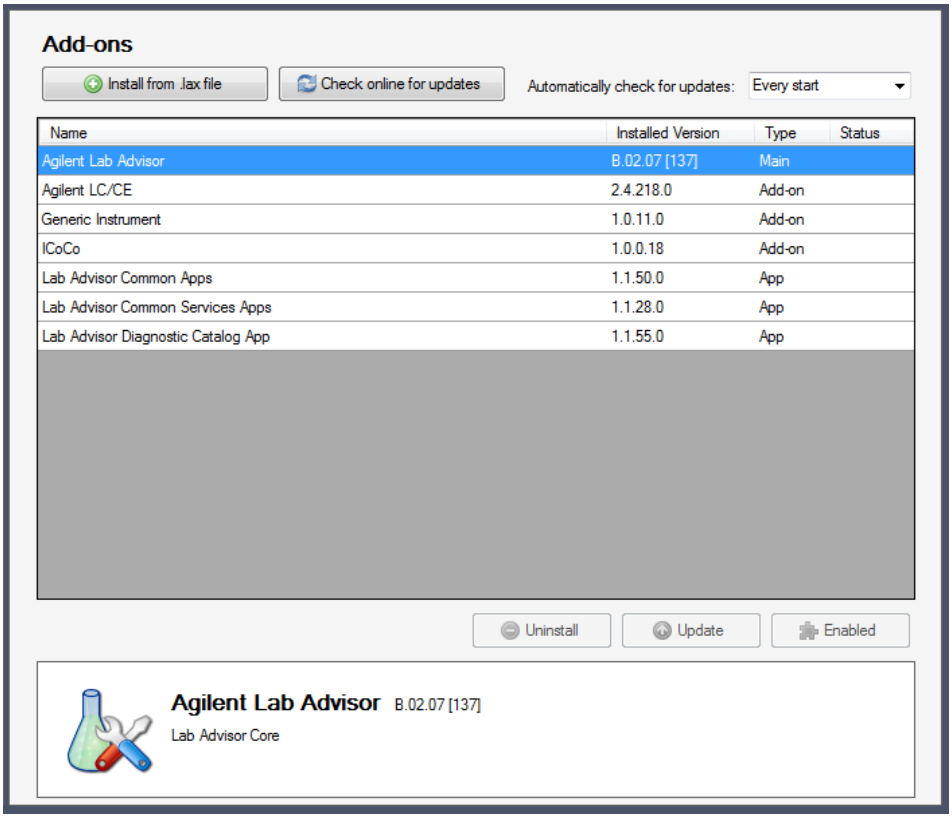


Figure 24 Add-ons in Configuration

The **Configuration - Add-ons** screen contains a table listing all the Add-ons that are already installed.

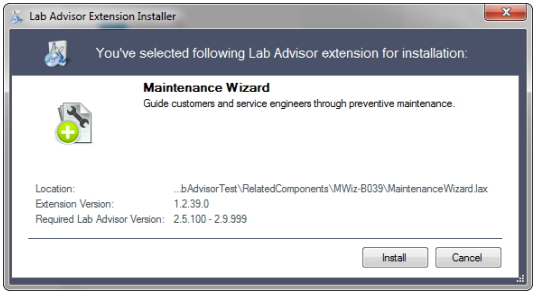
3 Click **Install from.lax file**.

A file selection dialog box is displayed to allow you to select the App or Add-on to install.

4 Navigate to the folder containing the Add-on files, select the.lax file and click **Open** to install the Add-on.

5 Click **Yes** when the request to shut down Lab Advisor appears.

Lab Advisor shuts down and the Add-on installation is started.



When the installation is finished, the newly installed Add-on is included in the table in the **Configuration - Add-ons** screen.

Software Configuration Settings

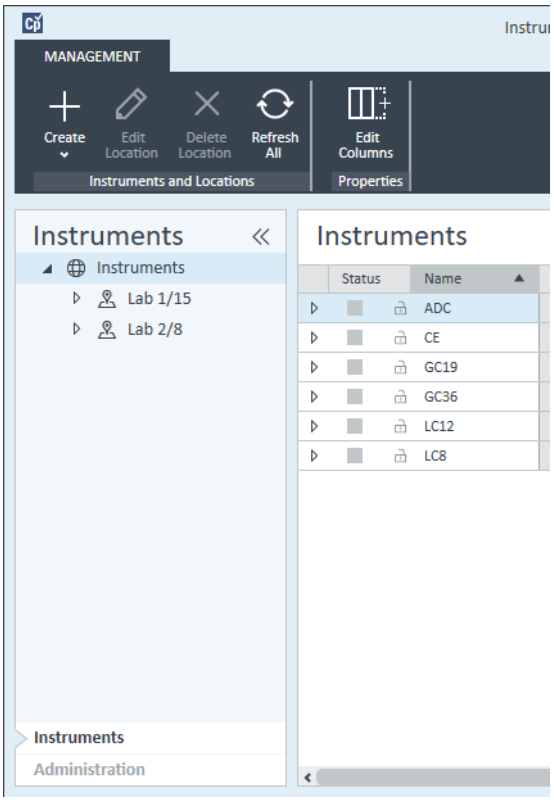
Configuration of the Online Sample Manager Set in OpenLab CDS

To control the Online LC System, the Online LC Monitoring Software is required. This software relies on an OpenLab CDS v2.x Workstation Plus installation.

The configuration of the Online LC System with Online Sample Manager Set needs to be done in OpenLab CDS to enable control functions through the Online LC Monitoring Software.

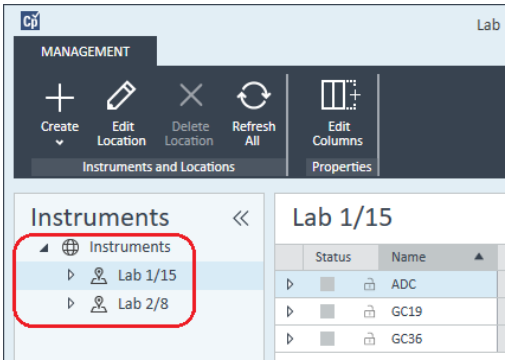
1 Open the **Agilent OpenLab Control Panel**:

2 Select the **Instruments** tab:



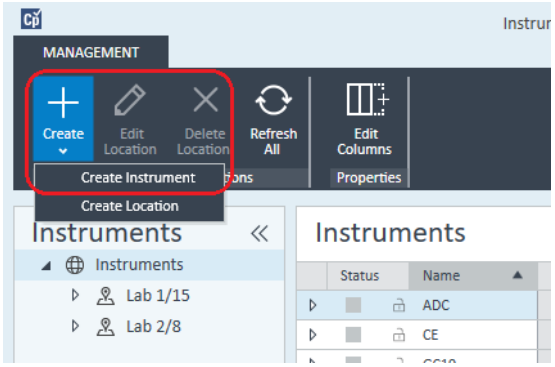
3 Select the location of the new instrument:

NOTE To create and edit locations, refer to the Control Panel online help.



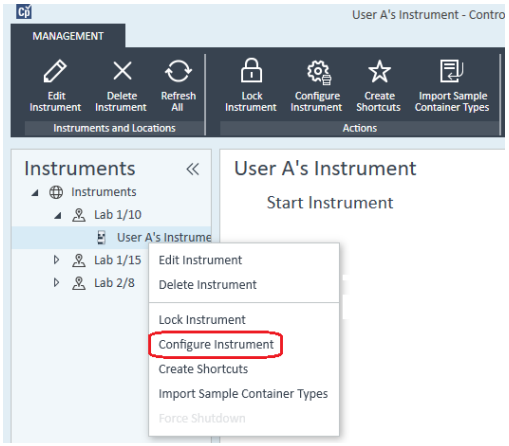
NOTE You can also add instruments directly in the **Instruments** node.

4 Click **Create >Create Instrument**



5 Enter the instrument details and click **OK**.

6 Navigate to the new instrument and click the **Configure Instrument** icon or right click the instrument name and select **Configure Instrument**.



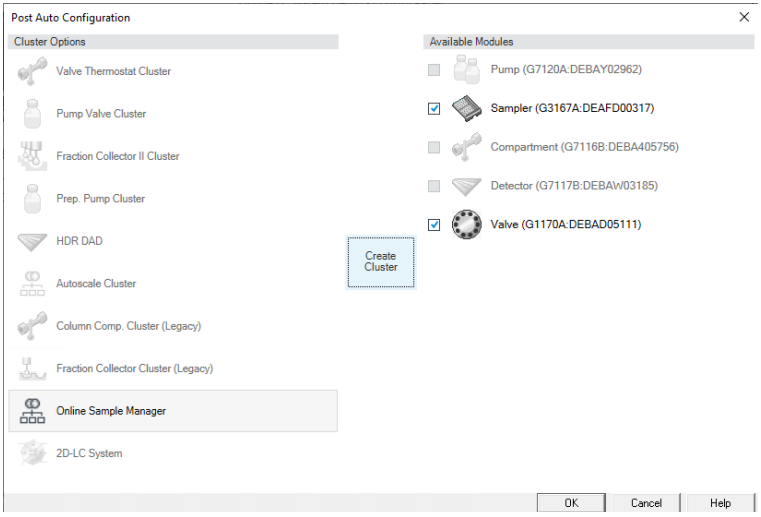
7 Use Autoconfiguration if possible.

OR

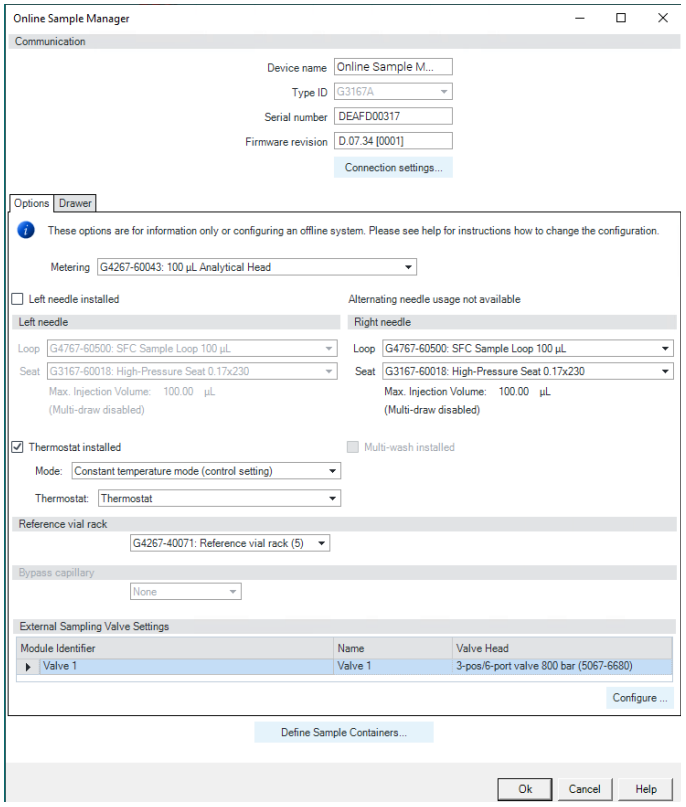
Select the module(s) for the instrument configuration and click the **>** button.

8 Enter the IP address for the configured LC system and click **OK**.

9 Select the clustering option for the Online Sample Manager and External Valve Drive.



10 Check the configuration of the External Sampling Valve type and select the Sample Thermostat option (if installed).



- **Device name**: based on the module.
- **Type ID**: based on the module (product number). Some modules may allow changing the type based on hardware/firmware. This results in a change of features and functions.
- **Serial number**: based on the module.
- **Firmware revision**: based on the module.
- **Options**: lists installed options.

Online LC Monitoring Software System Configuration

User Interface Reference

This section contains descriptions of all items of the Online LC Monitoring Software user interface:

- Menus,
- Toolbars, and
- Dialog boxes.

The following figure gives an overview on terms used to describe user interface elements.

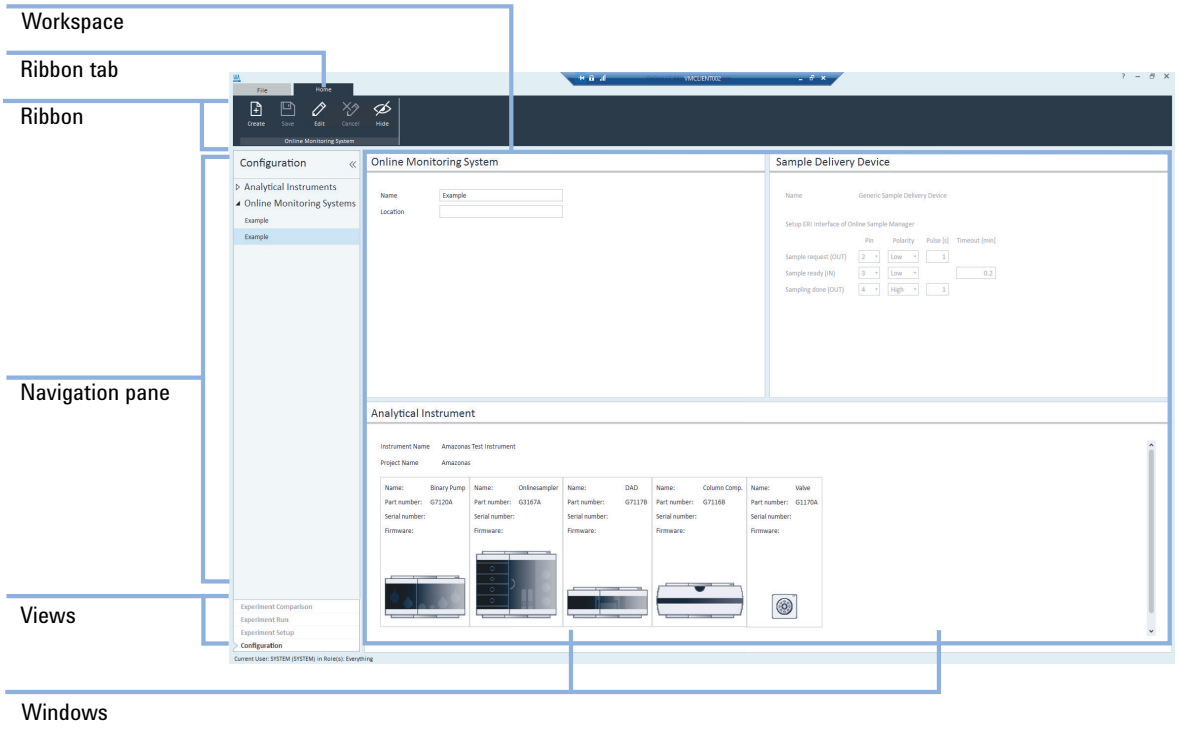


Figure 25 Overview of the Online LC Monitoring Software graphical user interface (GUI) - Configuration view

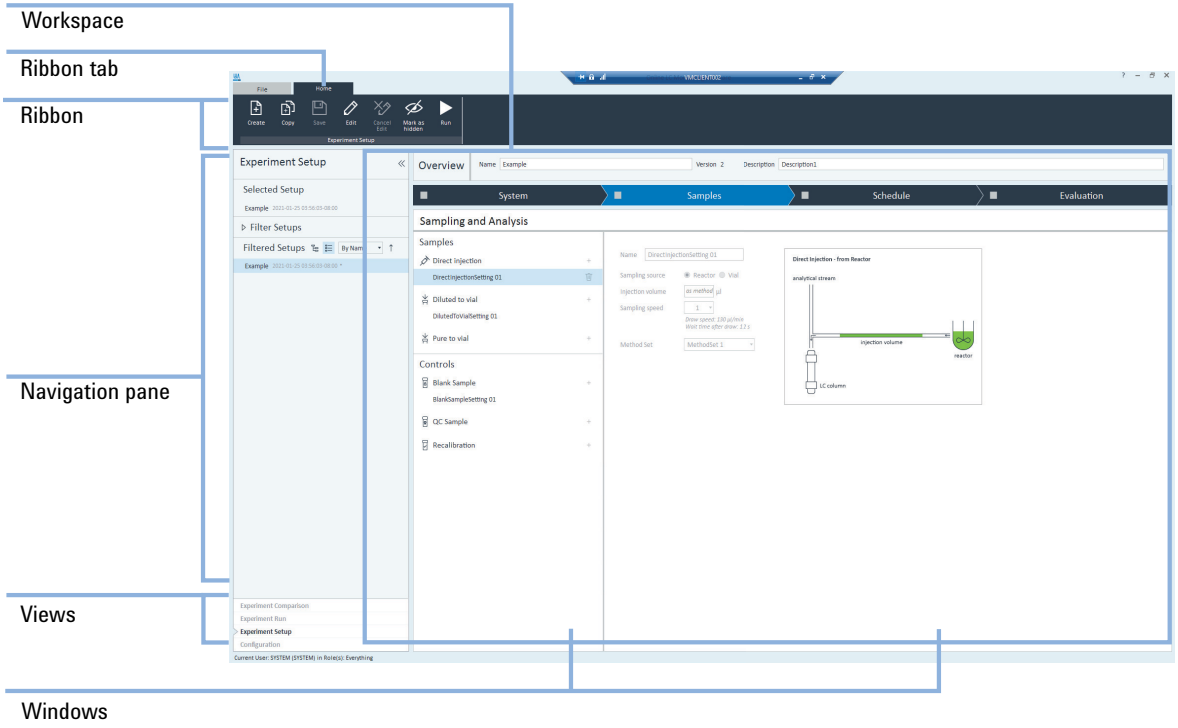


Figure 26 Overview of the Online LC Monitoring Software graphical user interface (GUI) - Experiment Setup view

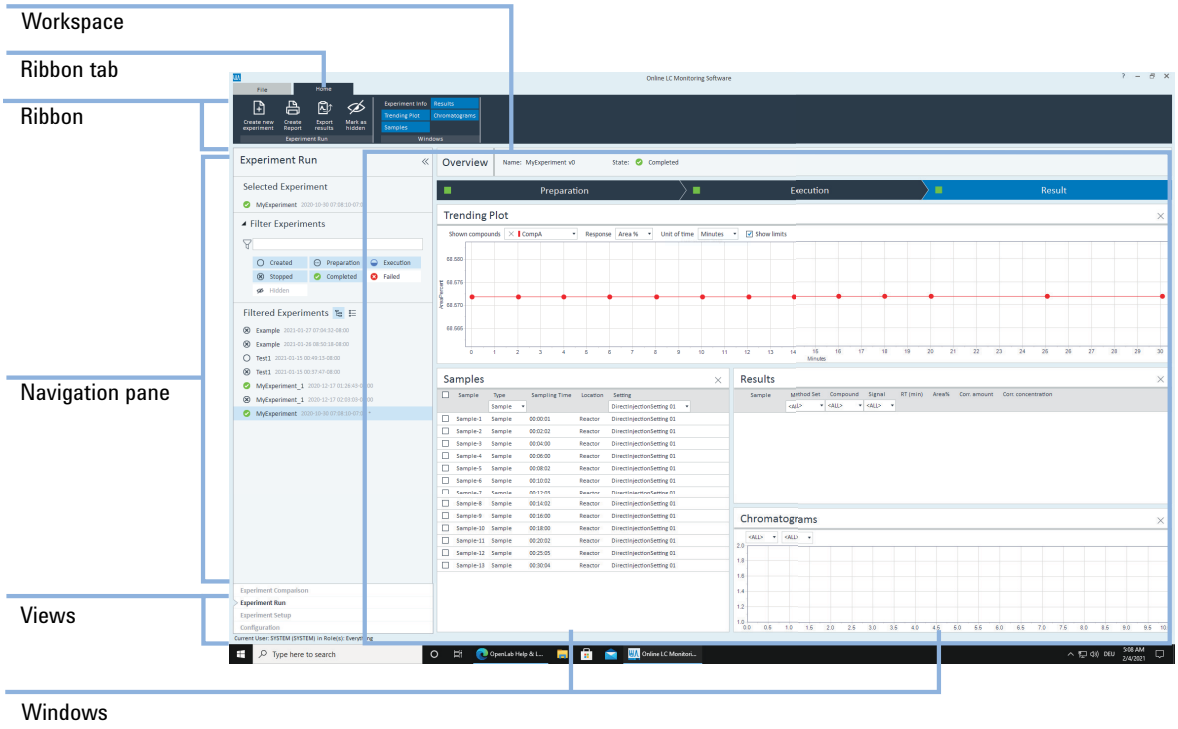
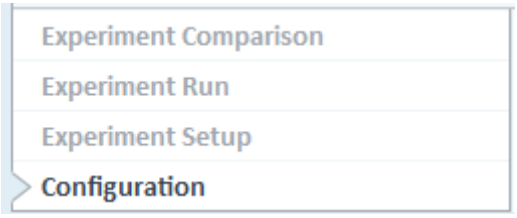


Figure 27 Overview of the Online LC Monitoring Software graphical user interface (GUI) - Experiment Run view

Configure a System

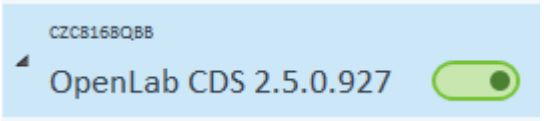
Create the System

1 In the navigation pane select Configuration view.



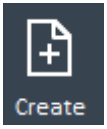
The **Online Monitoring System** specific Ribbon and **Configuration** in the Navigation pane are visible.

2 Synchronize with external equipment with the slider next to the installed OpenLab CDS (optional).



The available analytical instruments are listed in the project and can be updated.

3 In the **Home** Ribbon tab click **Create**.



The **Create Online Monitoring System** window opens.

Configure the System

In **Create Online Monitoring System**:

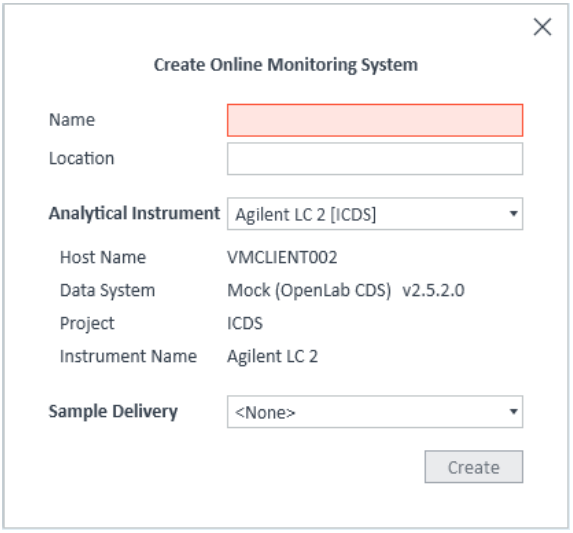


Figure 28 Create Online Monitoring System

1 To name your system appropriately, fill in the field **Name**.
2 Specify the system **Location** (optional).
3 Select an **Analytical Instrument** from the drop-down list.
4 Select a **Sample Delivery** option from the drop-down list.

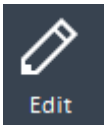
Save the Configuration

1 To save your configuration click **Create**.

Modify an Existing System

1 In the Online Monitoring Systems selector, select the system.

2 In the **Home** Ribbon tab, click **Edit**.



The fields **Name** and **Location** are now editable.

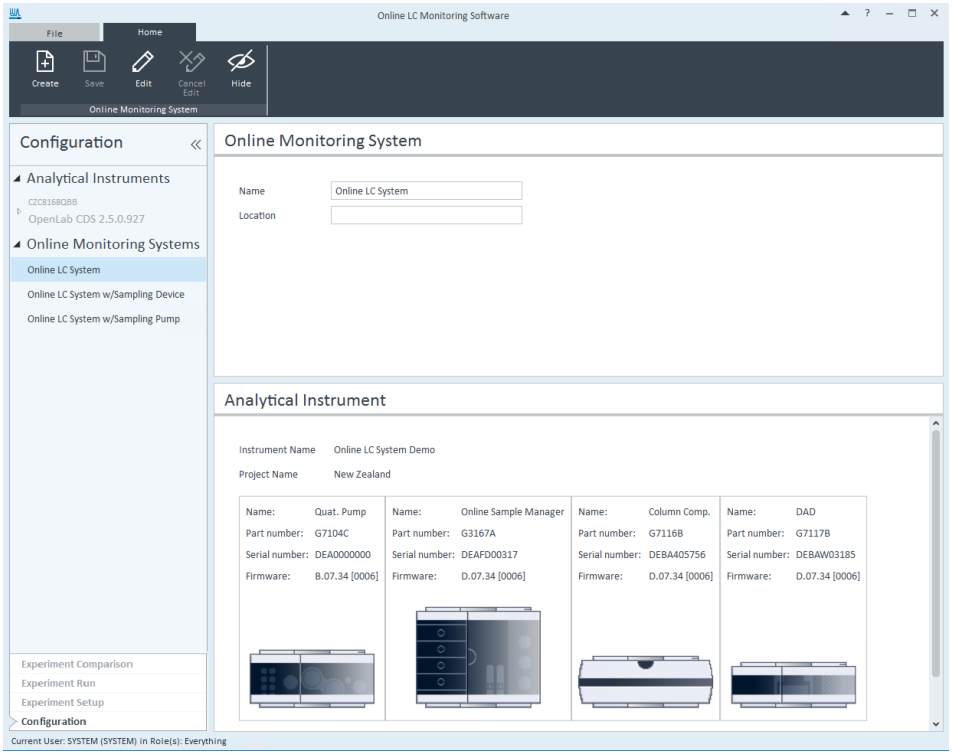
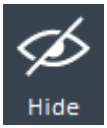


Figure 29 Configuration view of Online LC System without Sample Delivery Device

Hide/Unhide an Existing System

1 To hide an existing system, in the **Home** Ribbon tab click **Hide**.



The system is inactive.

2 To unhide a hidden system, in the **Home** Ribbon tab click **Unhide**.

The system is active.

Setup the ERI Interface

The Online Monitoring System consists of an analytical system and a sample delivery device (optional). To enable communication between the analytical and the sample delivery part of the system, the Online LC Monitoring Software supports configuration of an ERI interface.

This interface enables the following functions:

- Trigger a sample delivery pump (**Generic Sample Delivery Pump**)
- Communicate with a **Process Sampler** (**Generic Sample Delivery Device**)

Set up the ERI interface for a Generic Sample Delivery Pump

1. To enable triggering **Pump on (OUT)**, select the correct **Pin** from the drop-down list.
2. Select the correct **Polarity** from the drop-down list.
3. Define **Pump time [s]** in the field.

Set up the ERI interface for a Generic Sample Delivery Device

1 Define parameters for **Sample request (OUT)**:
   - **a** Select correct **Pin** from drop-down list.
   - **b** Select correct **Polarity** from drop-down list.
   - **c** Define **Pulse [s]** in the field.

2 Define **Sample ready (IN)**:
   - **a** Select correct **Pin** from drop-down list.
   - **b** Select correct **Polarity** from drop-down list.
   - **c** Define Timeout [min] in the field.

3 Define parameters for **Sampling done (OUT)**:
   - **a** Select correct **Pin** from drop-down list.
   - **b** Select correct **Polarity** from drop-down list.
   - **c** Define **Pulse [s]** in the field.

NOTE

The correct **Pin** depends on the hardware cabling. For **Pin** assignment, see the remote cable details in the corresponding chapter of the Online LC Solution User Manual.

NOTE

The correct **Polarity** depends on the sample delivery hardware.

NOTE

The **Timeout [min]** value defines the time, how long the software waits for an answer from the sample delivery device.

If no answer is coming back, the software sets this sample to missed and continues working on other items.

Configure Automatic Notifications

Preparations The required **Experiment Setup** is selected and in **Edit** mode.

Configure the SMTP Server

1 Under ribbon tab **File**, click **Email**.

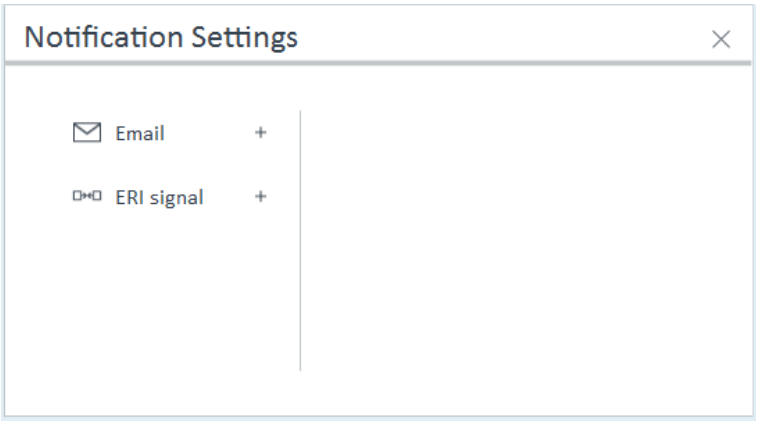
2 To configure the **SMTP Server**, fill in the following fields (entries depend on the Email-Server):

- Host, Sender Email (Mandatory)
- Port, Password (Optional)

3 Click **Save Settings**.

Define Email recipient groups in the step System

1 To add an Email recipients group, under **Notification Settings >Email** click .



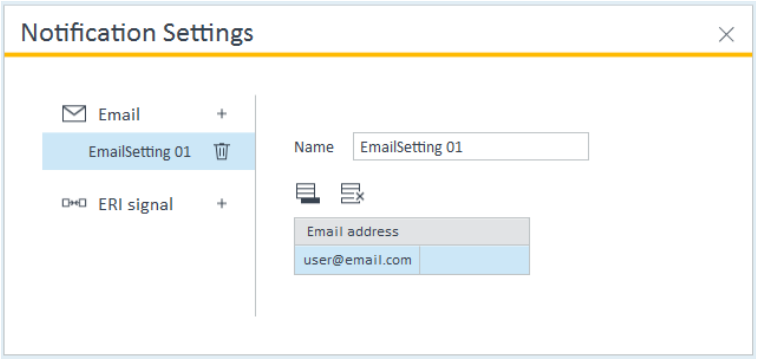
2 To define a target Email group, enter a meaningful **Name** to the field.

a To add Email recipients to the group, click .

OR

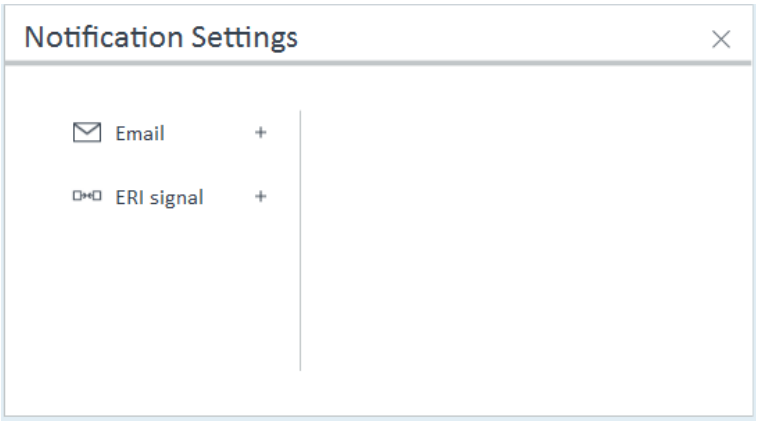
To remove Email recipients from the group, click .

An Email recipient group is defined.



Define ERI signals for automatic notifications in the step System

1 To add a **Notification Settings >ERI signal** click .

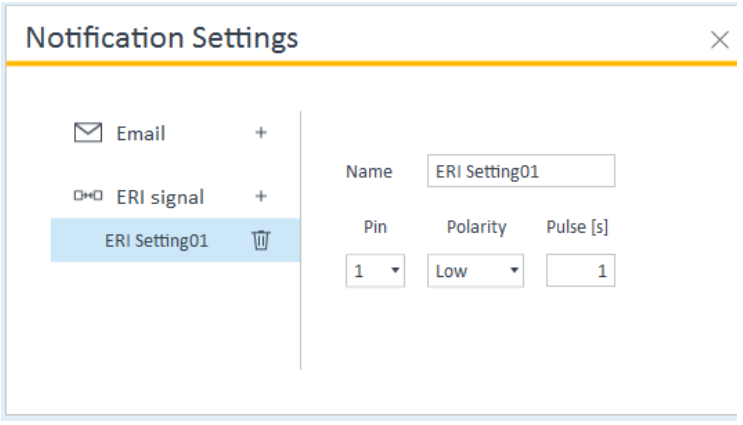


2 To define the ERI signal, enter a meaningful **Name** to the field.

a Select the ERI signal **Pin** from the drop-down list.

b Define the ERI signal **Polarity** from the drop-down list.

c Enter the ERI signal duration to the field **Pulse [s]**.

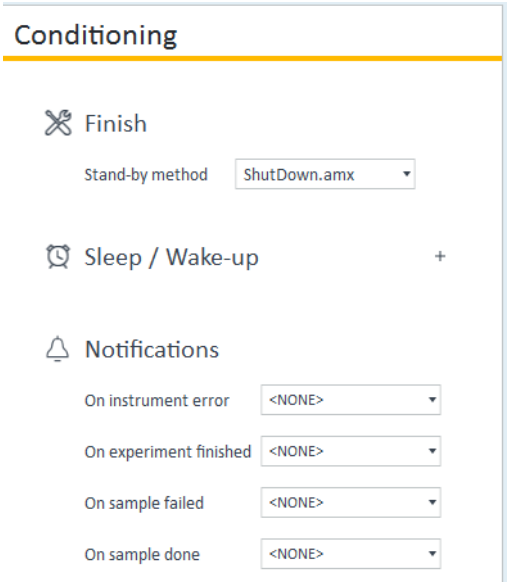


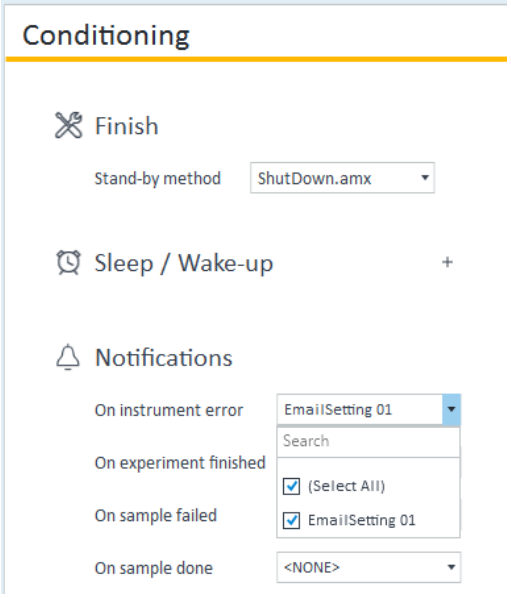
Remove Email recipients or ERI signals

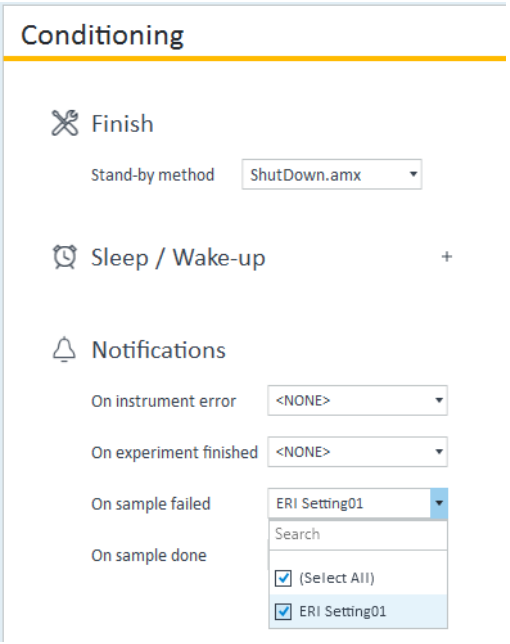
1 To remove Email recipients or ERI signals from the automatic **Notification Settings**, select the group and click .

Define recipients of automatic notifications depending on notification events

1 To define the automatic notification depending on optional events, under **Conditioning >Notifications** select recipients from the drop-down list.







2 In Experiment Setup, click **Save**.

The automatic notification is configured.

3 Quick Start Guide

This chapter provides information on running an Online LC System.

Best Practices

Daily / Weekly tasks

Daily Tasks

- Replace solvents and solvent bottles for mobile phases based on water/buffer.
- Replace solvents and solvent bottles for organic mobile phase latest every second day.
- Check presence of seal wash solvent.
- Purge each channel with fresh solvent at 2.5 – 3 mL/min for 5 min before operation.
- Equilibrate the system with composition and flow rate of subsequent method.

Weekly Tasks

- Change seal wash solvent (10 % isopropanol in water) and bottle.
- If applications with salts were used, flush all channels with water and remove possible salt deposits manually.
- Inspect solvent filters for dirt or blockages. Exchange if no flow is coming out of the solvent line when removed from the degasser inlet.

Power-up / Shut-down the pump

Prepare the Pump

- Use fresh or different mobile phase (as required).
- Purge each channel with 2.5 – 3 mL/min for 5 min. Open the manual purge valve or use the purge command, depending on the pump type.

Long-term shut-down of the system

- Flush system with water to remove buffer.
- Remove all samples from the sampler and store according to good laboratory practice.
- Use recommended solvents to store the system.
- Power off the system.

Prepare the pump

Purge

Use the Purge function to:

- fill the pump,
- exchange a solvent,
- remove air bubbles in tubes and pump heads.

Condition

Use the Conditioning function:

- daily when starting the pump,
- to minimize pressure ripple by dissolving air bubbles in pump heads.

NOTE

Condition your complete system with solvents and composition of your application (for example 50 %/50 % A/B at 0.5 mL/min).

Seal wash

Seal Wash guarantees a maximum seal life time. Use Seal Wash:

- When using buffers with elevated salt concentrations
- When using volatile solvents with non-volatile additives

CAUTION

Contaminated seal wash solvent

✓ **Do not recycle seal wash solvent to avoid contamination.**

✓ **Weekly exchange seal wash solvent.**

How to deal with solvents

- Use clean bottles only.
- Exchange water-based solvents daily.
- Select solvent volume to be used up within 1 – 2 days.
- Use only HPLC-grade solvents and water filtered through 0.2 µm filters.
- Label bottles correctly with bottle content, and filling date / expiry date.
- Use solvent inlet filters.
- Reduce risk of algae growth: use brown bottles for aqueous solvents, avoid direct sunlight.

Select channels for Gradient Valve

- Use lower channels (A and/or D) for buffer solutions.
- Regularly flush all gradient channels with water to remove possible salt deposits.
- Check compatibility of buffers and organic solvents to avoid precipitation.

Optional Inline Filter

The pump can be equipped with an additional inline filter (Inline filter assembly, material: stainless steel (5067-5407) or Inline Filter Assembly biocompatible (5720-0003)) with a nominal filter pore size of 0.3 µL.

Advantages of the inline filter:

- Very small internal volume
- Specified for working at high pressures
- Possibility of back-flushing the filter

Using the inline filter is recommended:

- to protect the downstream system from blockages,
- for solvent combinations that can form precipitation after mixing,
- for applications running with buffers.

General hints for effective use of the inline filter:

- filter solvents before use,
- follow best practices,
- back-flush the filter weekly,
- exchange the filter frit regularly.

CAUTION

Damage to the valve

✓ **Use the filter flush mode only if the optional inline filter is installed.**

See Technote G7167-90130 for further reference.

Prepare a Run

Prepare the run in OpenLab CDS

This procedure examplarily shows how to prepare a run. Parameters as shown in the screenshots may vary, depending on the system installed.

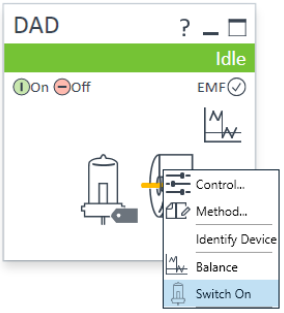
WARNING

Toxic, flammable and hazardous solvents, samples and reagents

The handling of solvents, samples and reagents can hold health and safety risks.

- ✓ **When working with these substances observe appropriate safety procedures (for example by wearing goggles, safety gloves and protective clothing) as described in the material handling and safety data sheet supplied by the vendor, and follow good laboratory practice.**
- ✓ **Do not use solvents with an auto-ignition temperature below 200 °C (392 °F). Do not use solvents with a boiling point below 56 °C (133 °F).**
- ✓ **Avoid high vapor concentrations. Keep the solvent temperature at least 40 °C (72 °F) below the boiling point of the solvent used. This includes the solvent temperature in the sample compartment. For the solvents methanol and ethanol keep the solvent temperature at least 25 °C (45 °F) below the boiling point.**
- ✓ **Do not operate the instrument in an explosive atmosphere.**
- ✓ **Do not use solvents of ignition Class IIC according IEC 60079-20-1 (for example, carbon disulfide).**
- ✓ **Reduce the volume of substances to the minimum required for the analysis.**
- ✓ **Never exceed the maximum permissible volume of solvents (8 L) in the solvent cabinet. Do not use bottles that exceed the maximum permissible volume as specified in the usage guideline for solvent cabinet.**
- ✓ **Ground the waste container.**
- ✓ **Regularly check the filling level of the waste container. The residual free volume in the waste container must be large enough to collect the waste liquid.**
- ✓ **To achieve maximal safety, regularly check the tubing for correct installation.**

1 Switch on the detector.

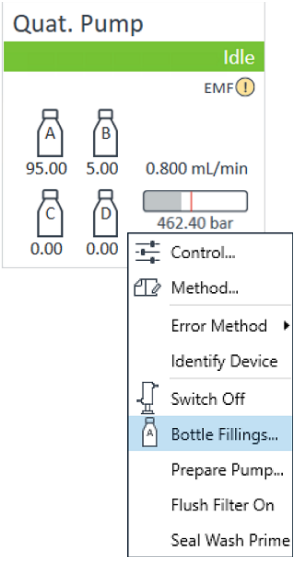


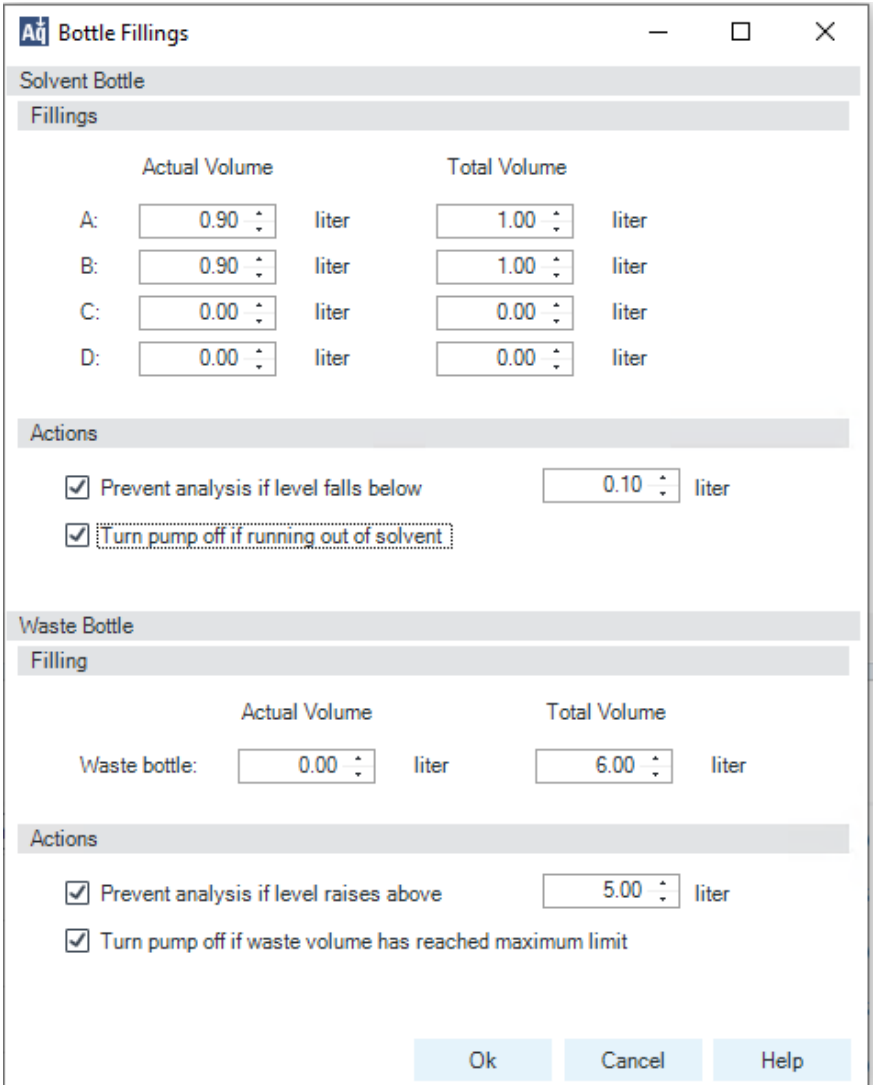
2 Fill the solvent bottles with adequate solvents for your application.

3 Place solvent tubings with bottle head assemblies into the solvent bottles.

4 Place solvent bottles into the solvent cabinet.

5 Set the **Bottle Fillings** option (in the software).





6 Purge the pump (in normal usage scenario).

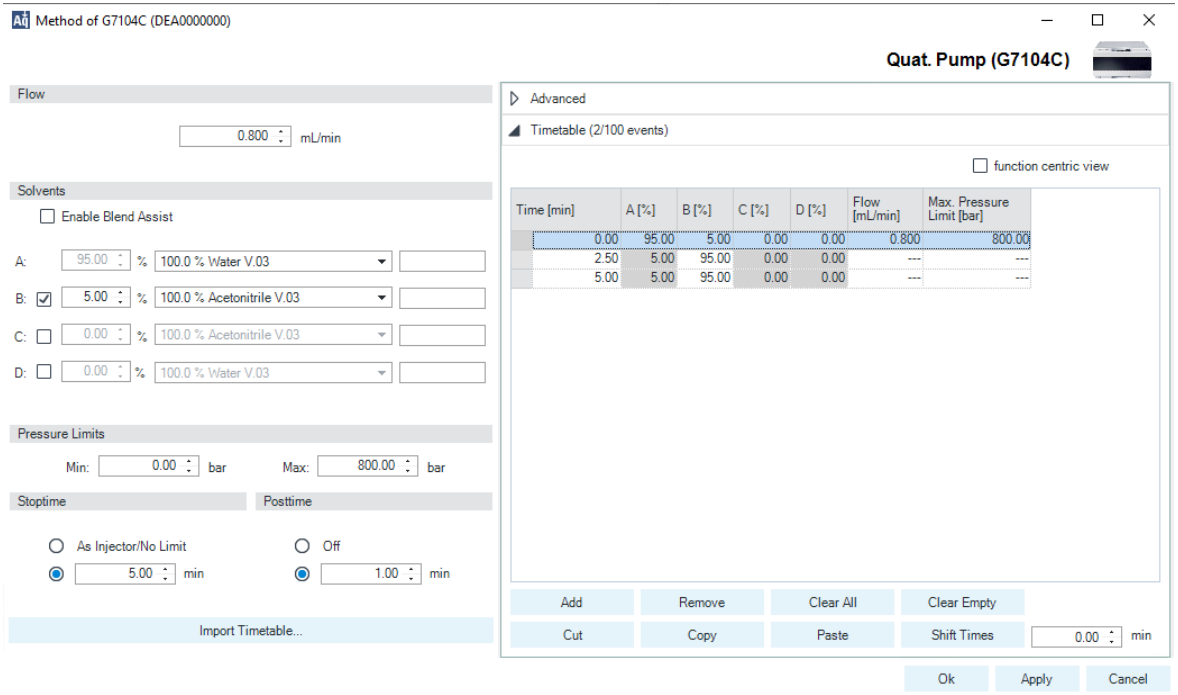
OR

Prime the pump (after installation of the system).

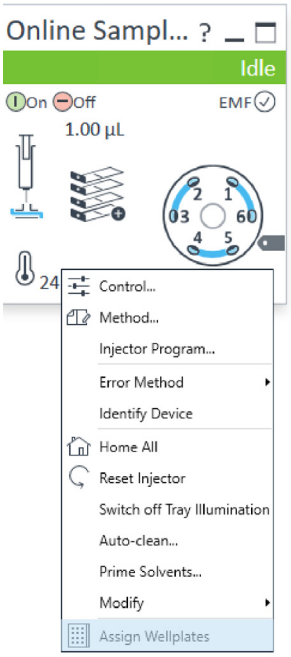
NOTE

For details on priming and purging, refer to the technical note *Best Practices for Using an Agilent LC System*.

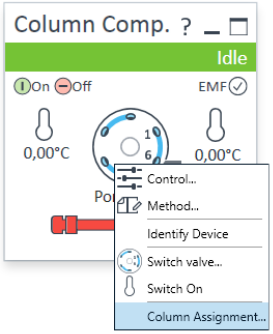
7 Adjust solvent composition after pump prime/purge (if necessary).



8 Set the tray configuration of the Online Sample Manager through the **Assign Wellplates** option.



9 Add a new column.



10 Enter the column information.

Plumbing

Valve Position	Location
1	Left 1
2	Left 2

Visualization

Valve Type: 2-pos/6-port valve 600 bar (5067-4137)

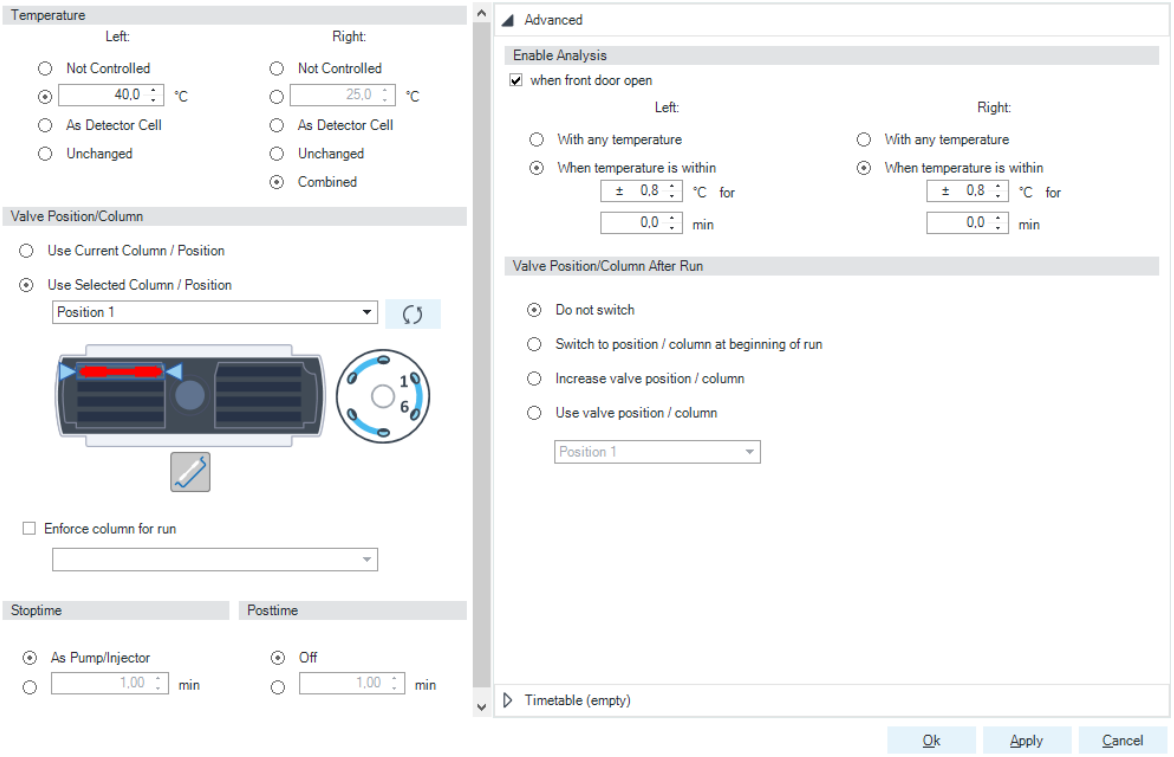
Column Tag Information

>>

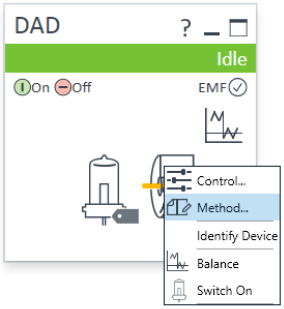
Location	Color Code	Description	Length [mm]	Diameter [mm]	Particle Size [µm]	Max. Pressure [bar]	Injections
Left 1	Red		0	0,0	0,0	0	0
Left 2	Blue		0	0,0	0,0	0	0
Left 3	None		0	0,0	0,0	0	0
Left 4	None		0	0,0	0,0	0	0
Right 1	None		0	0,0	0,0	0	0
Right 2	None		0	0,0	0,0	0	0
Right 3	None		0	0,0	0,0	0	0
Right 4	None		0	0,0	0,0	0	0

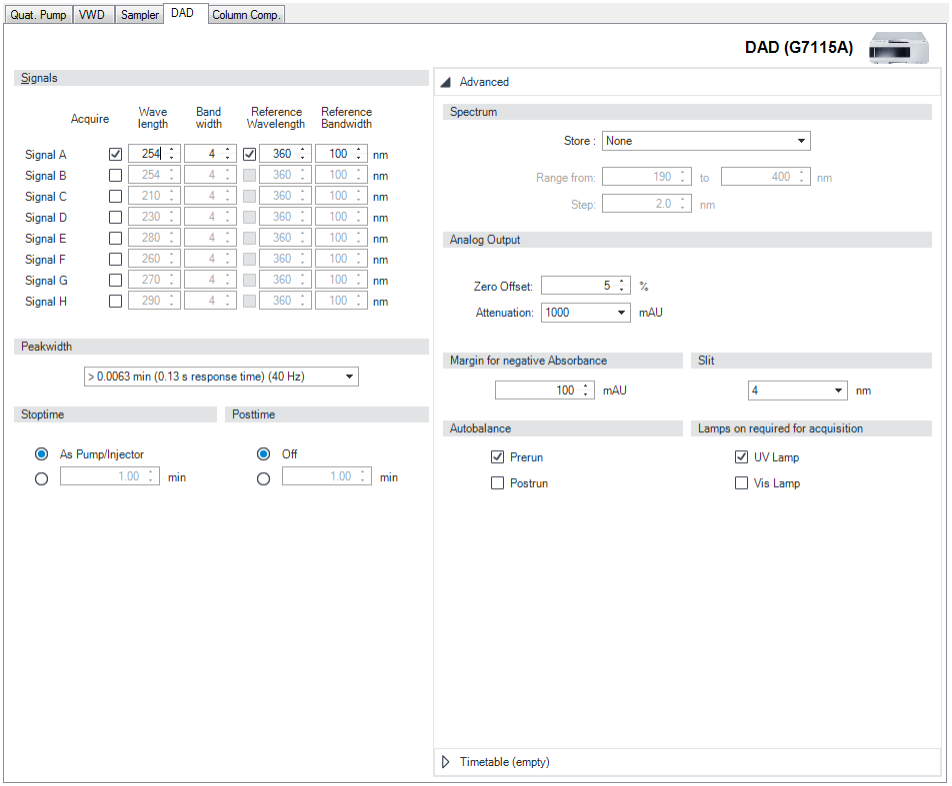
Ok/Write Tag Cancel Help

11 Select the column position.



12 Set the detector according to the needs of your method.





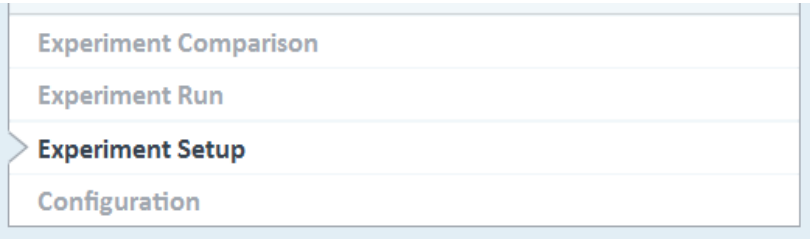
Prepare the run in the Online LC Monitoring Software

Setup an Experiment

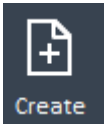
Create a new Experiment Setup

For detailed in information on the available GUI-elements, see the Online Help of the Online LC Monitoring Software.

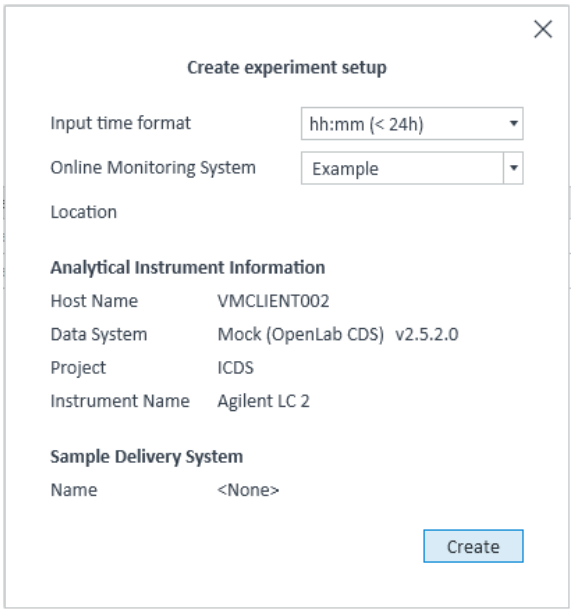
1 To enable setup of an experiment, in the Navigation pane click **Experiment Setup**.



2 In the **Home** Ribbon tab, click **Create**.



The **Create experiment setup** window opens.

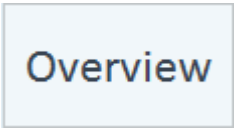


3 From the drop-down list, select an **Online Monitoring System** and click **Create**.

You can now set up an experiment.

Define and Describe an Experiment

In the **Overview** Workspace:



1 Define a **Name** and add a **Description**.

NOTE

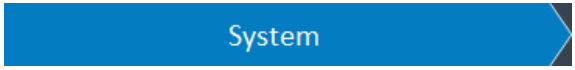
You can change name and description of an experiment at any time.

Continue to set up the experiment.

Setup Method Sets

The user needs to define the analytical methods to be used during the experiment.

In the step **System**:



1 To define your method sets, in the **Analytical Instrument** Workspace click:

This action adds a method set to the **Definition of method sets** table. You can select the desired method from a dropdown list.

NOTE

All in the dropdown lists available methods derive from OpenLab CDS, where they must be defined for your instrument.

For details, see **Home >How To >OpenLab CDS >Acquisition >Acquisition Overview**.

2 In the **Conditioning** Workspace define additional settings (optional) for **Start**, **Finish**, and **Sleep/WakeUp** functions. For details, see the Online Help of the Online LC Monitoring Software.

The **System** is defined.

Add Sampling Settings

The step **Samples** allows the user to setup multiple sampling modes. For detailed information, see the Online LC Monitoring Software Online Help or refer to the *Agilent InfinityLab Online LC Solutions User Manual*.

Customize a Samples injection

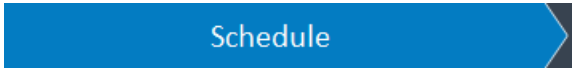
1 To add a **Samples** injection, in the **Samples** window click:

2 To add a **Controls** injection, in the **Controls** window click:

Define Experiment Schedule

The Online Sample Manager Set and the Online LC Monitoring software are designed to monitor chemical reactions.

Since chemical reactions can vary greatly in time, it is essential to define reasonable times when samples should be taken. The step **Schedules** provides a table to enter meaningful values.



1 To change **Rule based** settings, click:

The window, where you can edit these previously set up settings, opens.

2 To add a **Time based** sampling event to the schedule, click: 

a Select **Setting** from a dropdown list.

NOTE

These settings were defined in the step **Samples**.

You can click  to see and change these settings.

b Fill in **Start time**, and optionally two of the following parameters:

- To calculate **End time**, fill in **Interval** and **Count**.
- To calculate **Count**, fill in **Interval** and **Start last action**.
- To calculate **Interval**, fill in **Count** and **Start last action**.

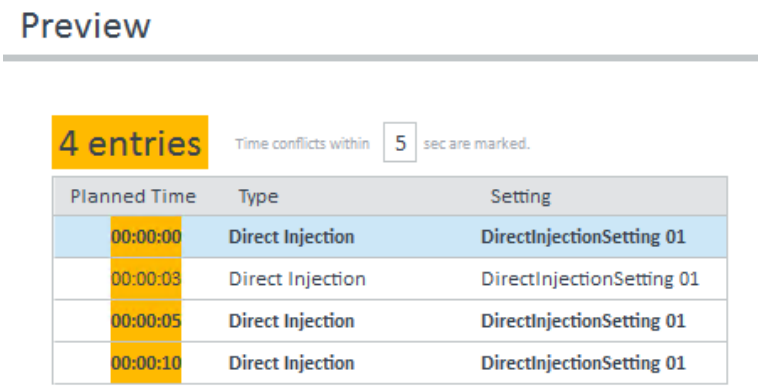
The software automatically calculates the missing parameter.

NOTE

To identify time conflicts, use the window **Preview**:

Problematic entries are marked orange.

Example for conflicting entries



Define Compound Limits

To set up warning limits for compound values, the user can define **Upper limits** and/or **Lower limits** at certain time points.

Definition of Compound Limits in step Limits

1 Select **Compound Name** and **Response** from drop-down lists.

2 To add a limit, click:

This adds a row to the **Compound Limit** table.

NOTE

Define at least two lower limits.

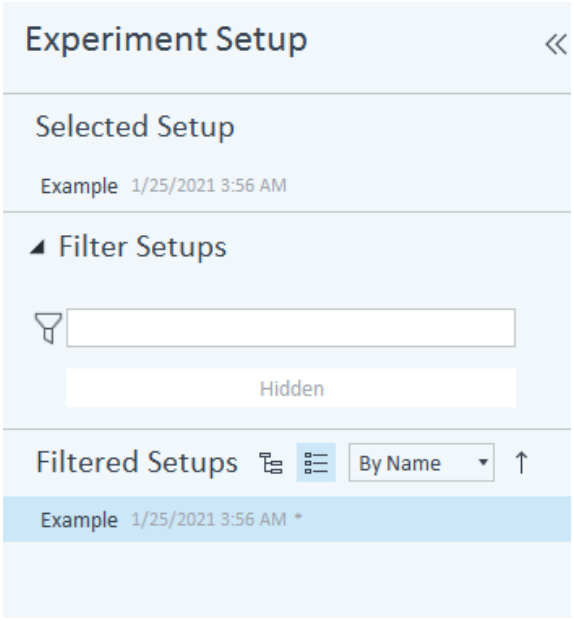
NOTE

To enable this option, the compound must be calibrated in the OpenLab CDS Data Analysis method that was selected in the table for definition of Method Sets in the step System during Experiment Setup.

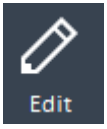
Edit an Existing Experiment Setup

It is possible to edit an existing experiment setup.

1 In the **Experiment Setup** Navigation pane select the experiment.



2 In the **Home** Ribbon tab click **Edit**.

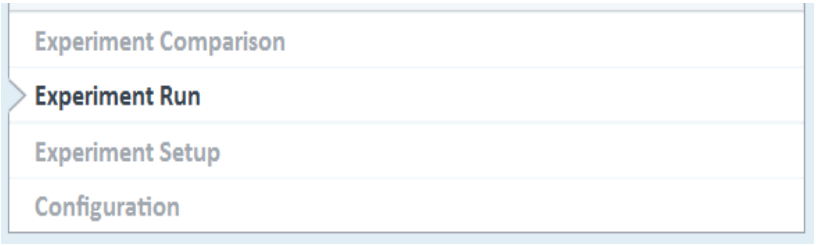


You can now edit the settings.

Run an Experiment

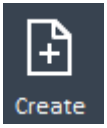
Start an Experiment

1 In the navigation pane select **Experiment Run** view.

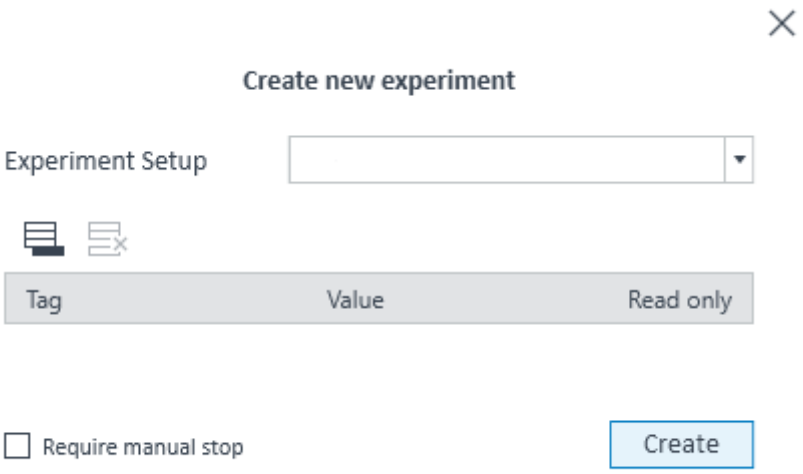


The **Experiment Run** specific Ribbon and **Experiment Run** in the Navigation pane are visible.

2 In the **Home** Ribbon tab, click **Create**.



The dialog box **Create new experiment** opens.



3 Select an **Experiment Setup** from the drop-down list.

NOTE The drop-down list contains the options that were created under **Experiment Setup**.

[OPTIONAL] **4** Define a tag/value pair (e.g. customer-specific information to categorize the experiment).

- To add a tag/value pair, use:

- To delete a tag/value pair, use:

NOTE This information can by default be modified during the experiment run, and is visible in report, and csv export. The **Read only** check box can be selected to prevent modification of the tag/value pair.

[OPTIONAL] **5** Select the **Require manual stop** check box.

NOTE If selected, the experiment will not finish automatically, and the user needs to explicitly stop it. By selecting the check box, the experiment can be edited in real time during an ongoing run.

6 To start the experiment, click **Create**.

Experiment starts.

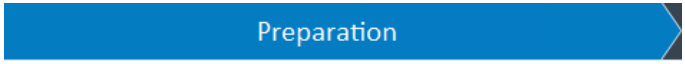
NOTE To stop an experiment, in the Ribbon click **Stop experiment**.

You are asked to note down, why you stopped the execution of the experiment.

NOTE It is possible to add injections to an experiment. The software therefore provides a table and assists in finding possible settings.

Prepare an Experiment

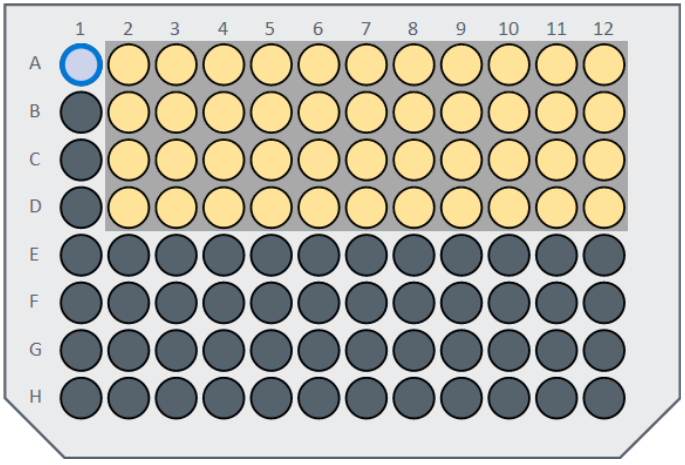
To successfully run an experiment, the user must provide all source and/or target locations in the step **Preparation**.



1 Select an action.

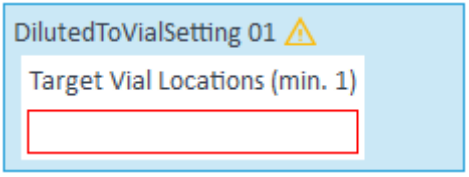
2 To specify the source/target location, use the graphical display.

NOTE It is not possible to specify used locations.



The minimum number of required target values is shown.

The setting remains incomplete, if the required number of vial locations is not reached.



NOTE An incomplete setting prevents the start of the experiment.

3 Monitor the experiment run in the step **Execution**.

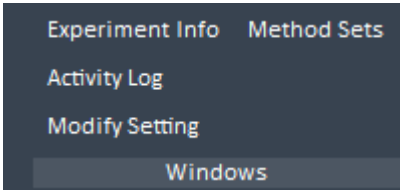
As long as the experiment runs, the following windows help to change or monitor valuable additional information:

- **Experiment Info**

  It is possible to edit informations about the experiment.
- **Activity Log**

  Provides detailed information about the experiment.
- **Modify Setting**
- **Method Sets**

  Shows the Method Sets of the experiment in the run.



System Checkout

Checkout Procedure in OpenLab CDS

Checkout Method

This is an exemplary method for the Agilent InfinityLab Online LC Series.

Exemplary configuration:

- Flexible Pump G7104C
- Online Sample Manager G3167A
- Multicolumn Thermostat G7116A
- Diode Array Detector WR G7115A

The RRLC checkout sample (5188-6529) serves as standard for gradient systems and contains 100 ng/µL each of nine components dissolved in water / acetonitrile (65/35). The nine components are:

- Acetanilide
- Acetophenone
- Propiophenone
- Butyrophenone
- Benzophenone
- Valerophenone
- Hexanophenone
- Heptanophenone
- Octanophenone

NOTE

Find the correct settings for the individual modules here:

- Checkout method parameter settings Flexible Pump (G7104C), Bio High-Speed Pump (G7132A) and Bio Flexible Pump (G7131A) (Table 3 on page 99)
- Checkout method parameter settings Online Sample Manager (G3167A/B) (Table 4 on page 100)
- Checkout method parameter settings Multicolumn Thermostat (G7116A/B) (Table 5 on page 100)
- Checkout method parameter settings Diode Array Detectors (G7117A/B/C) or Diode Array Detector WR (G7115A) (Table 6 on page 101)
- Checkout method parameter settings Variable Wavelength Detector (G7114A/B) (Table 7 on page 101)

Checkout column options:

p/n	Description
693575-302	InfinityLab Poroshell 120 2.7 µm EC-C18, 3.0 x 150 mm, 1000 bar
695575-302	InfinityLab Poroshell 120 2.7 µm EC-C18, 3.0 x 100 mm, 1000 bar
699675-902	InfinityLab Poroshell 120 1.9 µm EC-C18, 2.1 x 50 mm, 1300 bar

Table 3 Checkout method parameter settings Flexible Pump (G7104C), Bio High-Speed Pump (G7132A) and Bio Flexible Pump (G7131A)

Parameter	Value
Flow	0.8 mL/min
Solvent A	Water
Solvent B	ACN
Compressibility	Use solvent types
Composition	5 %B (ACN)
Composition	95 %A (Water)
Stoptime	5 min
Pressure Limit	800 bar
Minimum Stroke	Automatic
Timetable	2.5 min 95 %B
Posttime	1 min

Table 4 Checkout method parameter settings Online Sample Manager (G3167A/B)

Parameter		Value
Injection		1 µL
Stoptime		as pump
Draw speed		100 µL/min
Flowthrough	ADVR	active
	Sample Flush Out Factor	3.0
Feed	Feed Speed	Adaptive 80 %
	Sample Flush Out Factor	Automatic

Table 5 Checkout method parameter settings Multicolumn Thermostat (G7116A/B)

Parameter	Value
Temperature (left)	40 °C
Temperature (right)	combined
Stoptime	as pump

Table 6 Checkout method parameter settings Diode Array Detectors (G7115A/G7117A/B/C)

Parameter	Value
Signal A	254/4 nm
Ref A	360/100 nm
Peakwidth	40 Hz
Stoptime	as pump
Spectrum	None
Autobalance	Prerun

Table 7 Checkout method parameter settings Variable Wavelength Detector (G7114A/B)

Parameter	Value
Wavelength	254 nm
Peakwidth	40 Hz
Stoptime	as pump
Autobalance	Prerun

Setup the Checkout Method

NOTE

The setup of the checkout method in this procedure is an example. For the individual module parameters, see Checkout Method ("Checkout Method" on page 98).

1. Turn on the lamp.
2. Load the default method Untitled.amx.
3. Change the method and timetable settings for the 1260 Infinity II Flexible Pump (G7104C).

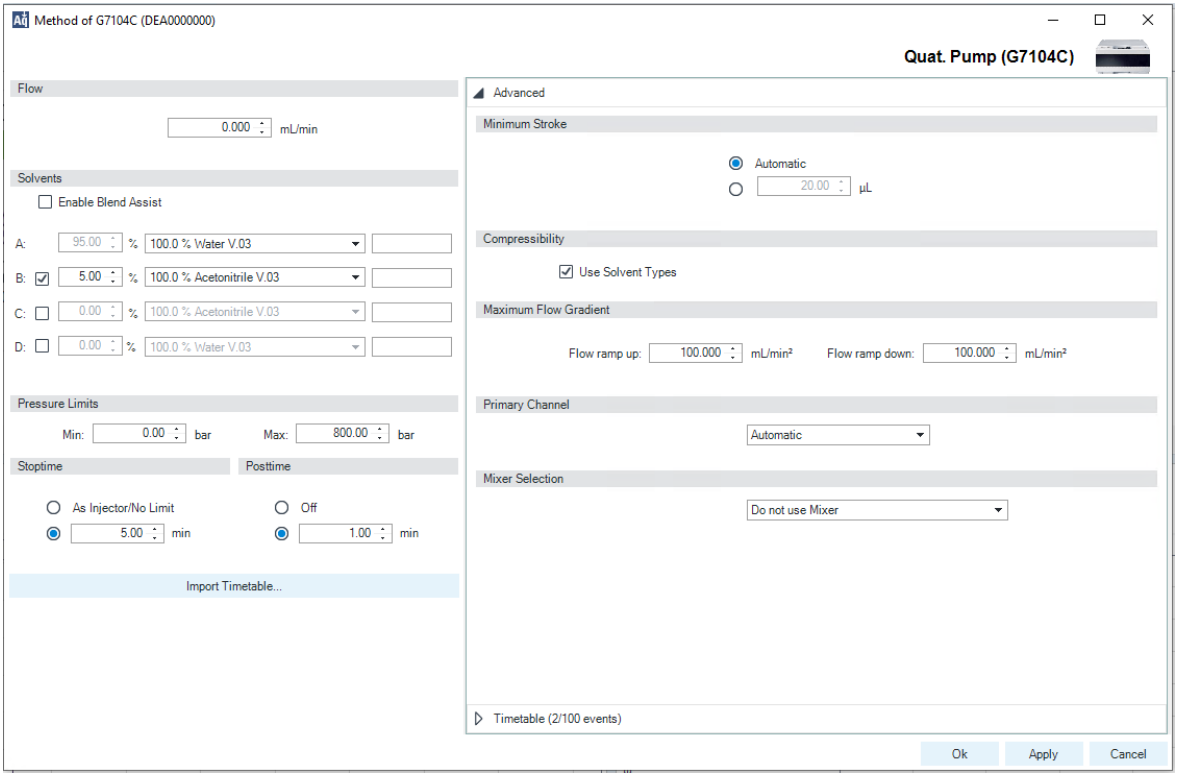


Figure 30 Method settings 1260 Infinity II Flexible Pump (G7104C)

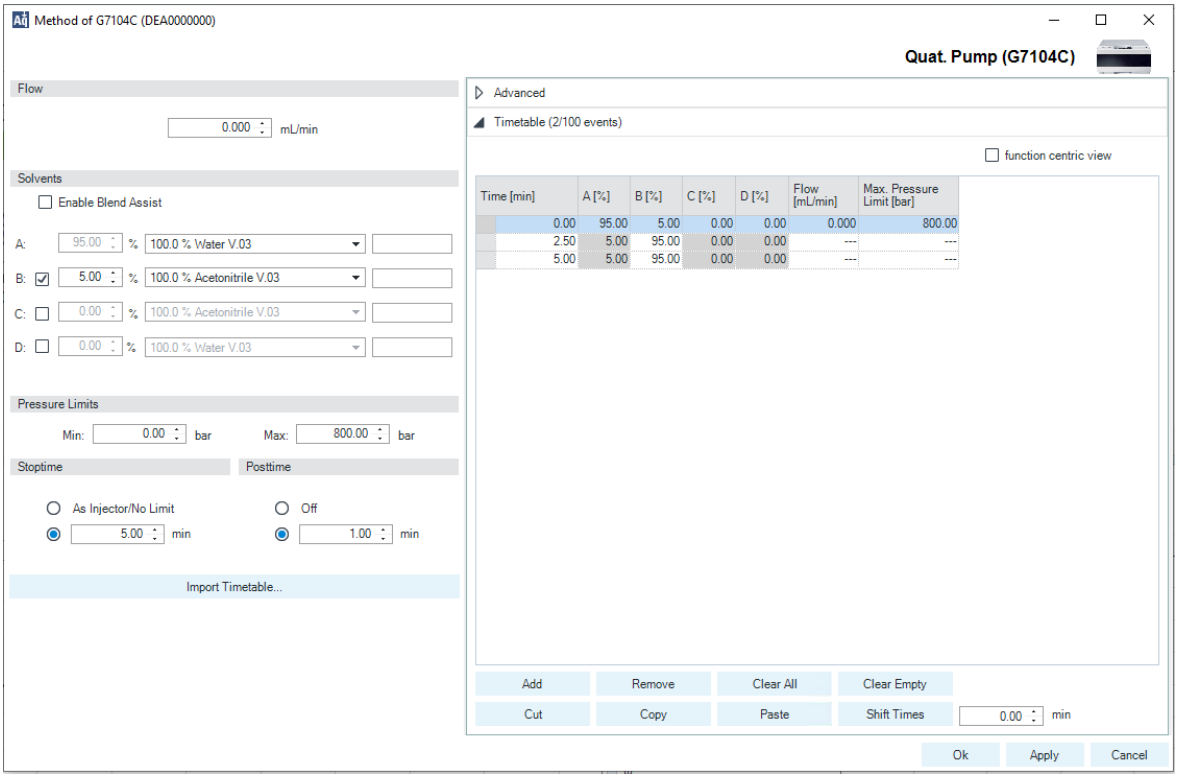


Figure 31 Timetable settings 1260 Infinity II Flexible Pump (G7104C)

4 Change the method settings for the 1260 Infinity II Online Sample Manager (G3167A).

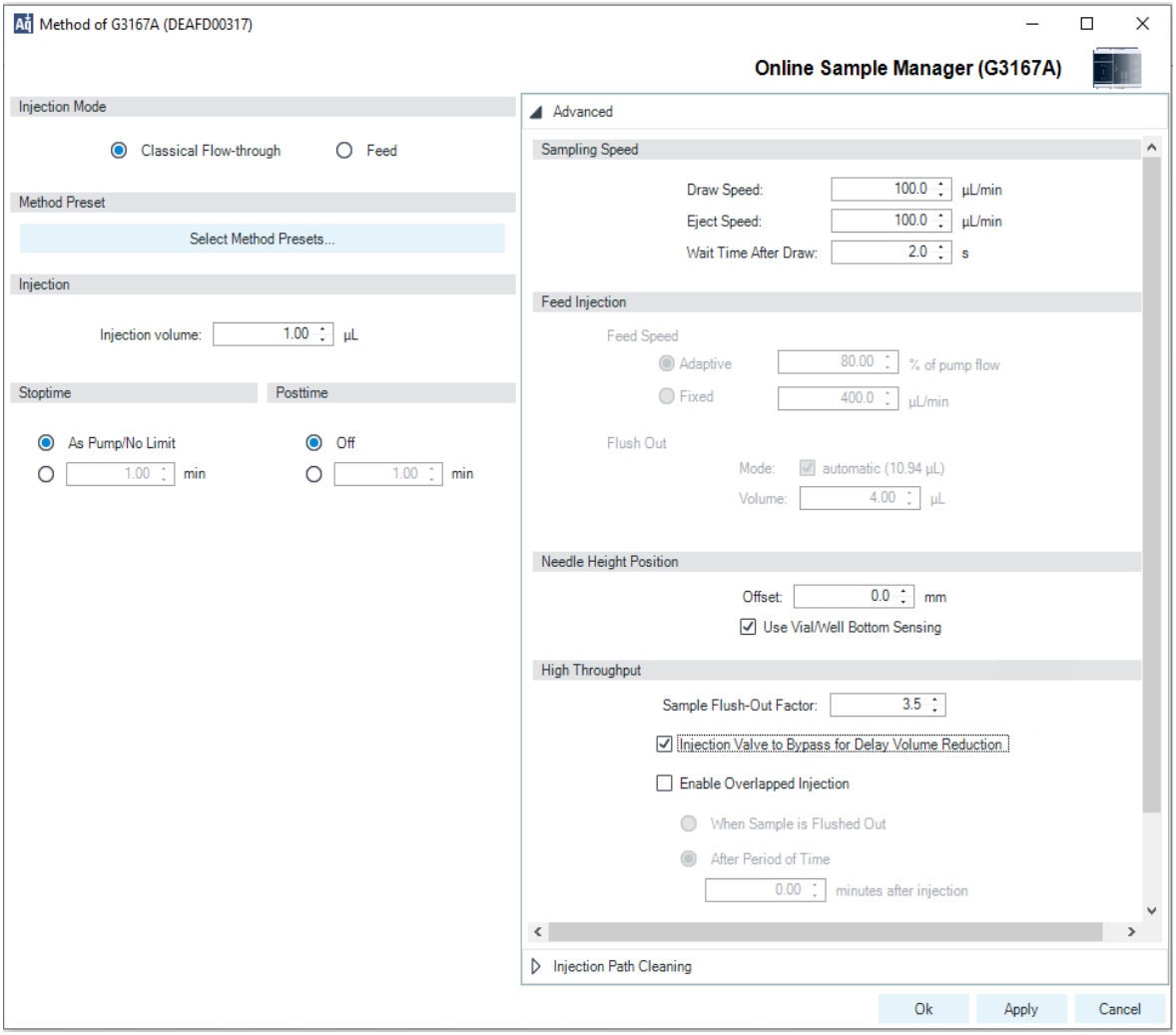


Figure 32 **Method settings 1260 Infinity II Online Sample Manager (G3167A) - Flow-Through Injection Mode**

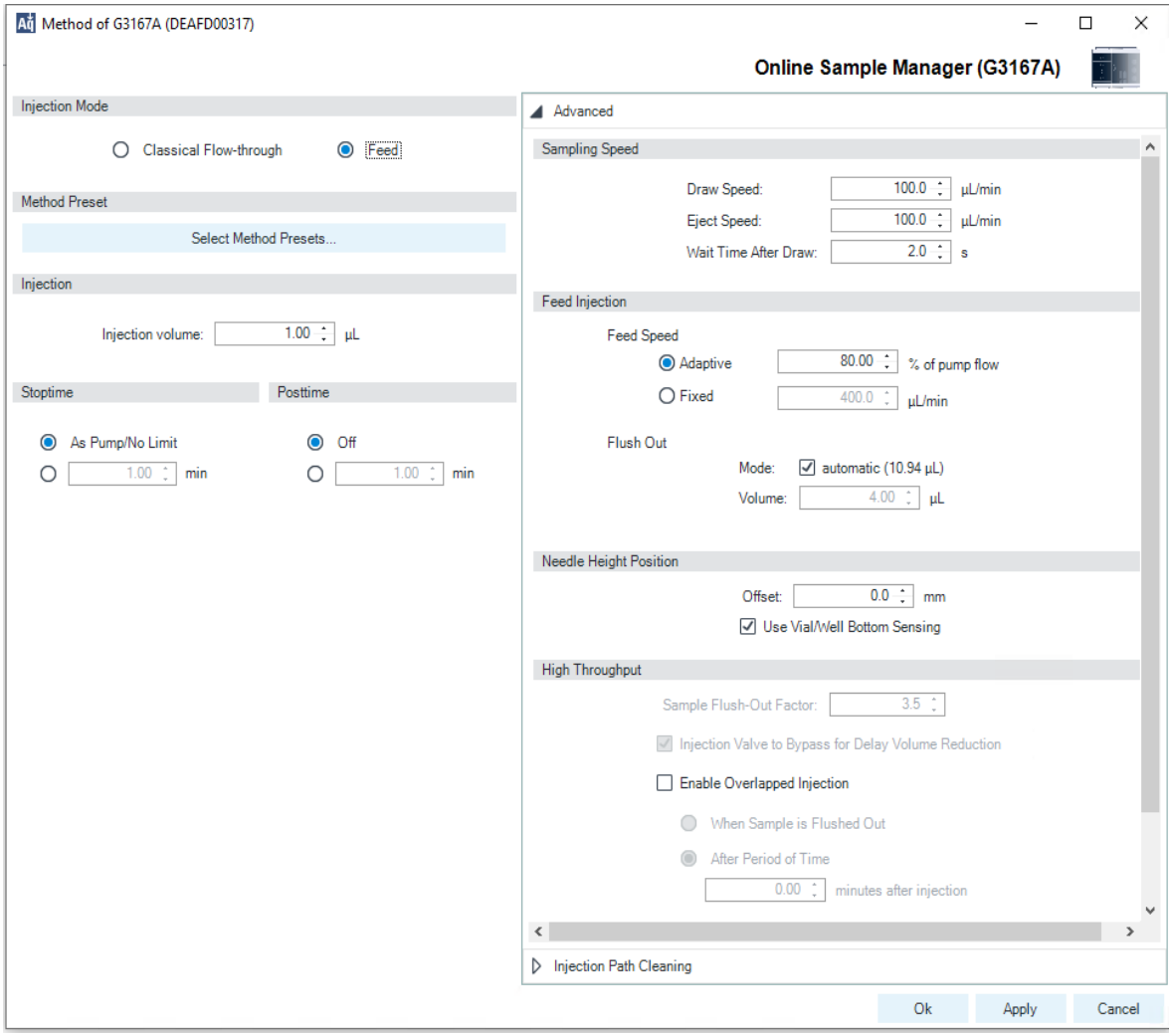


Figure 33 Method settings 1260 Infinity II Online Sample Manager (G3167A) - Feed Injection Mode

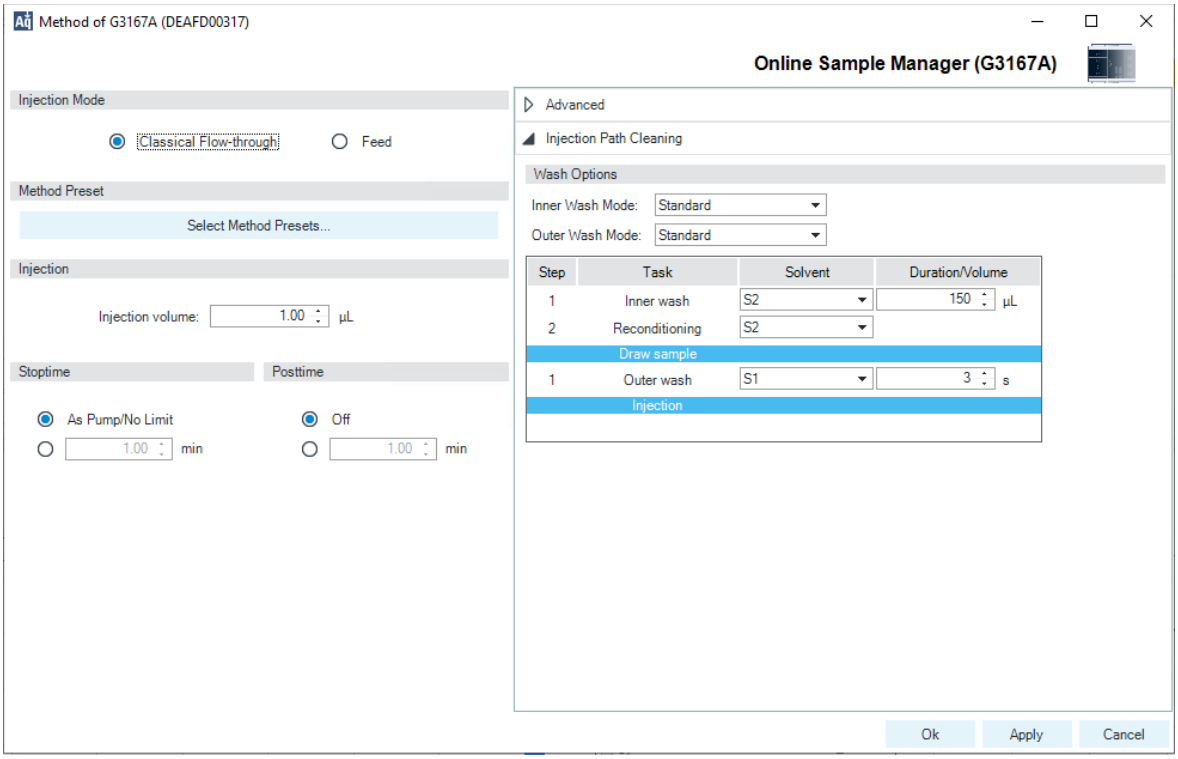


Figure 34 Method settings 1260 Infinity II Online Sample Manager (G3167A) - Injection Path Cleaning for Flow-Through Injection

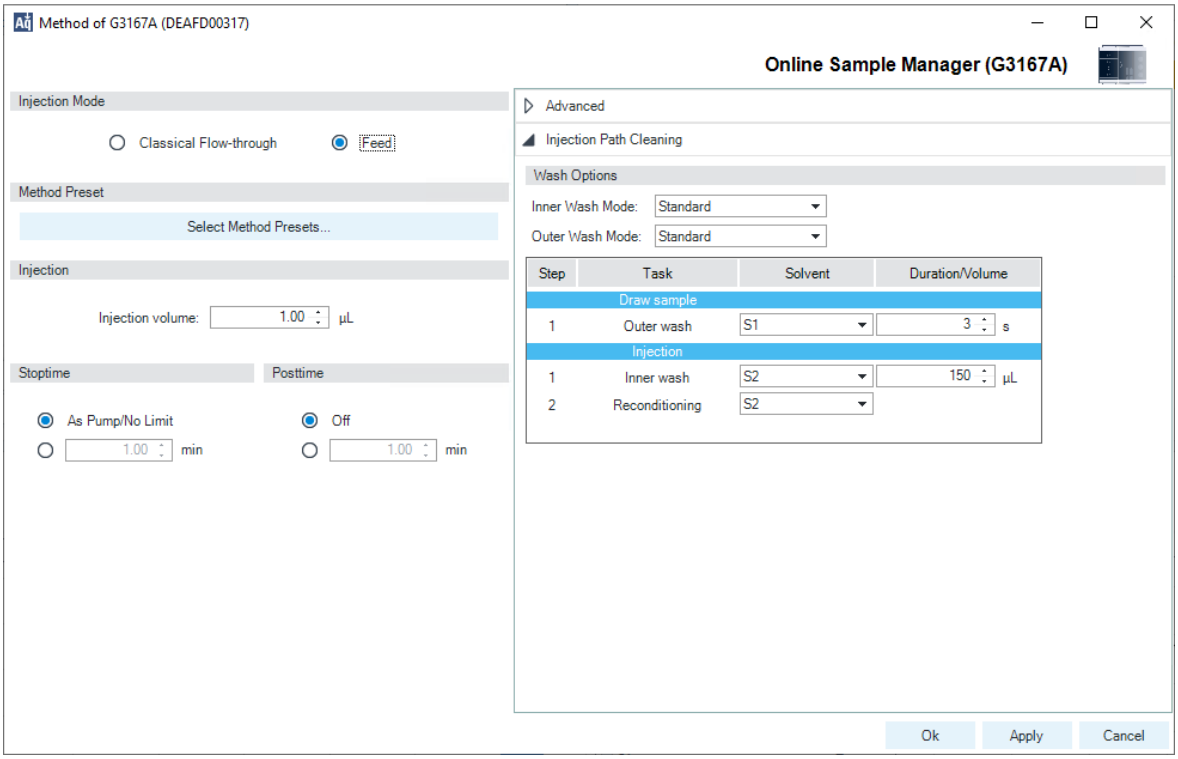


Figure 35 Method settings 1260 Infinity II Online Sample Manager (G3167A) - Injection Path Cleaning for Feed Injection

NOTE

For detailed information of the method settings, see *Method Parameter Settings* in the *Agilent InfinityLab Online LC Solutions User Manual*.

5 Change the method settings for the 1260 Infinity II Multicolumn Thermostat (G7116A).

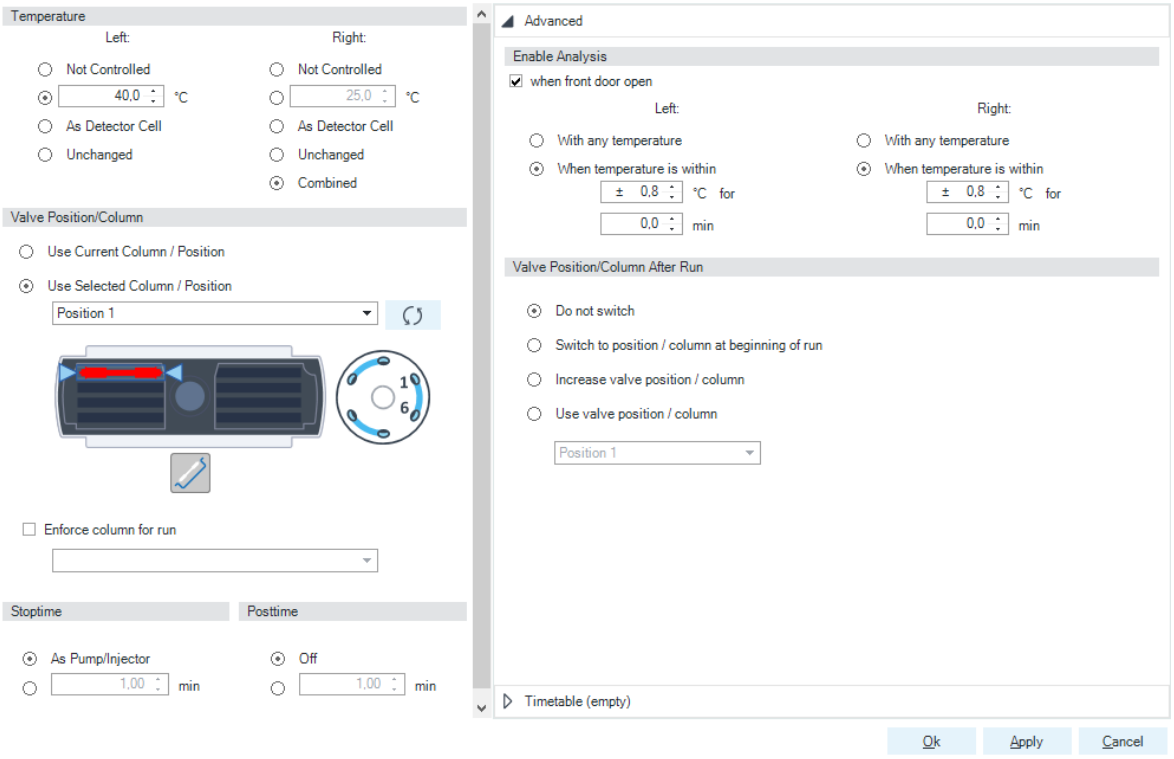


Figure 36 Method setting 1260 Infinity II Multicolumn Thermostat (G7116A)

6 Change the method settings for the 1260 Infinity II Diode Array Detector WR (G7115A).

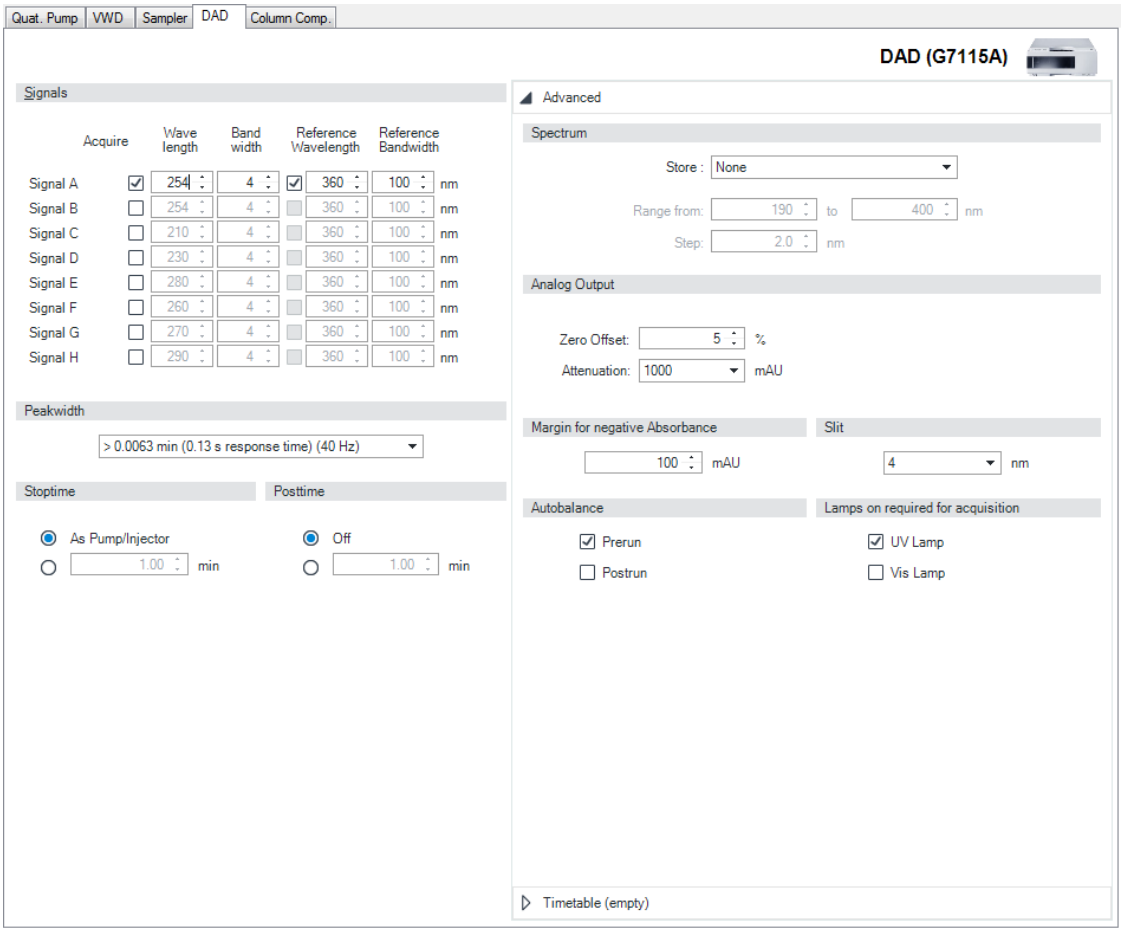


Figure 37 Method setting 1260 Infinity II Diode Array Detector WR (G7115A)

7 Save the methods as CheckOut_FTI.amx (for flow-through injection) and CheckOut_FI.amx (for Feed Injection).

8 Equilibrate the system for 10 min under checkout conditions.

9 Run the CheckOut_FTI.amx checkout method in OpenLab CDS and evaluate the analysis results.

NOTE

Perform this run using the 1260 Online Sample Manager in the configuration delivered from the factory. Do not install the capillary connections to the External Sampling Valve before.

10 Create a data analysis method in OpenLab D/A for the calibrated components of the checkout sample mixture. Use the analysis results of the method CheckOut_FTI.amx.

11 Save the method as CheckOut_DA.pmx.

Checkout Procedure in Online LC Monitoring Software

This procedure describes the checkout procedure for the 1260 Infinity II Online Sample Manager Set and 1290 Infinity II Bio Online Sample Manager Set.

1. Connect the capillaries between the Online Sample Manager and External Sampling Valve. For guidance, see the *Agilent InfinityLab LC Series Online Sample Manager Sets Installation Guide*.
2. To test for leaks in the injection and sampling flow-path, perform the Hydraulic Path Leak Test through the Lab Advisor Software.
3. Perform a Sampler Leak Test through the Lab Advisor Software if needed for further troubleshooting if the Hydraulic Path Leak Test failed. Use a blank nut to block the flow-path in port 6 of the Online Sample Manager Injection Valve.
4. Create the Experiment in the Online LC Monitoring Software. See the Online Help for guidance.
5. Create the Method Set for Feed Injection in the Online LC Monitoring Software. See the Online Help for guidance.
   a. Use the Feed Injection method, previously created in OpenLab CDS, as acquisition method.
   b. Use the previously created Checkout D/A method in OpenLab CDS as data analysis method.
6. Create the Method Set for Flowthrough Injection in the Online LC Monitoring Software. See the Online Help for guidance.
   a. Use the Flowthrough Injection method, previously created in OpenLab CDS, as acquisition method.
   b. Use the previously created Checkout D/A method in OpenLab CDS as data analysis method.
7. Create a sample type for 1 µL Direct Feed Injection from the External Sampling Valve.
8. Create a sample type for 1 µL Direct Flowthrough Injection from the External Sampling Valve.
9. Create two sample types for Sample Diluted to Vial (30 µL) with 20-times dilution (target volume: 600 µL) with sequential:
   a. 20 µL Direct Feed Injection from the vial with diluted sample.
   b. 20 µL Direct Flowthrough Injection from the vial with diluted sample.
10. Arrange a schedule for the previously created samples in the Online LC Monitoring Software.

11 Prepare the Online LC System for the checkout as described in the *Agilent InfinityLab LC Series Online Sample Manager Sets Installation Guide*.

a Collect 250 µL of the checkout sample into the syringe from the Checkout Kit.

b Attach the syringe containing the checkout sample to the Syringe Adapter installed on the External Sampling Valve.

12 Execute the Experiment run.

a Specify the two vials for the runs of the 20-times diluted checkout sample collected as sample diluted to vial, and scheduled with sequential direct Feed and flow-through injection.

b Supply 50 – 80 µL of the checkout sample for each of the runs with injection from the External Sampling Valve.

c Evaluate the Experiment run results. Use the chromatogram overlay and peak area trending plots for it.

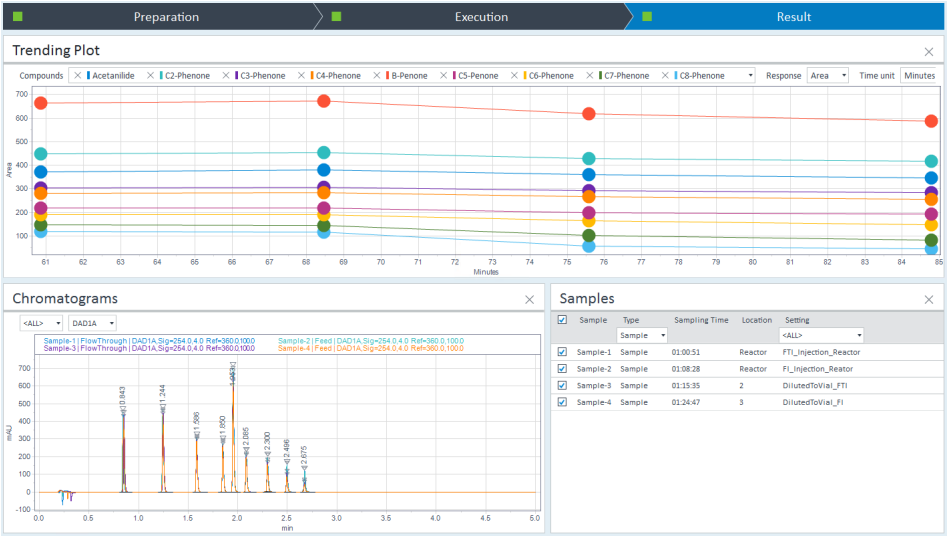


Figure 38 Evaluation of the experiment results example

4 Parts and Consumables

This chapter provides information on additional parts and consumables.

System Specific Kits

1260 Infinity II Online Sample Manager Accessory Kit

Item	#	p/n	Description
	1	G3167-68000	1260 Infinity II Online Sample Manager Accessory Kit
1	1	8121-3099	CAN Cable, 1 m, flat (not shown)
2	2	G3167-42000	Single Holder UVD Multi Function
3	4	0515-5869	Screw-Tapping Pan-HD Hexalobular-Recess (not shown)
4	2	5043-1356	Column Holder Lamella
5	1	2110-1486	Fuse 2 AT250 V
6	1	5043-0270	Leak plane
7	1	5043-0271	Holder leak plane
8	1	5067-4792	Leak sensor assembly
9	1	5063-6527	Tubing, Silicon Rubber, 1.2 m, ID/OD 6/9 mm
10	1	5500-1156	T-Tube Connector ID6.4
11	1	5067-6680	3-position/6-port FI valve 800 bar
12	1	5004-0011	Capillary ST 0.12 mm x 160 mm SL/SL
13	1	5005-0057	Capillary ST 0.17 mm x 160 mm SL/SL
14	3	G4220-60007	Bottle Head Assembly
	1	5004-0014	Capillary ST 0.17 mm x 500 mm SX/SL (not shown)
	1	5004-0015	Tubing PTFE 0.8 mm x 180 mm SL/no (not shown)
	3	5043-1013	Tubing Clip IF-II (not shown)
	1	5067-5967	Tubing Clip Tube Connector (not shown)

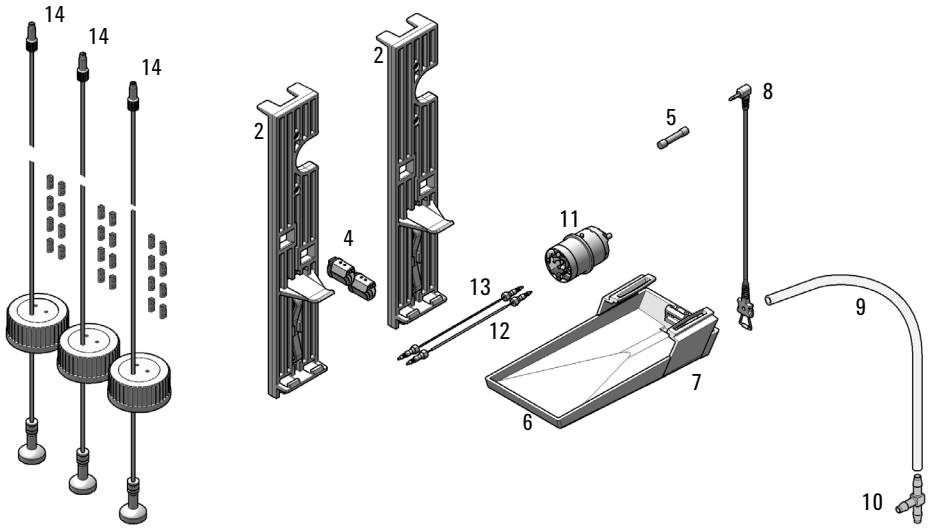


Figure 39 1260 Infinity II Online Sample Manager Accessory Kit

1290 Infinity II Bio Online Sample Manager Accessory Kit

For 1290 Infinity II Bio LC modules, use bio / biocompatible parts only.
Do not mix parts between 1260 Infinity II Bio-Inert LC modules and 1290 Infinity II Bio LC modules.

Item	#	p/n	Description
	1	G3167-68010	1290 Infinity II Bio Online Sample Manager Accessory Kit
1	1	8121-3099	CAN Cable, 1 m, flat (not shown)
2	2	G3167-42000	Single Holder UVD Multi Function
3	4	0515-5869	Screw-Tapping Pan-HD Hexalobular-Recess (not shown)
4	2	5043-1356	Column Holder Lamella
5	1	2110-1486	Fuse 2 AT250 V
6	1	5043-0270	Leak plane
7	1	5043-0271	Holder leak plane
8	1	5067-4792	Leak sensor assembly
9	1	5063-6527	Tubing, Silicon Rubber, 1.2 m, ID/OD 6/9 mm
10	1	5500-1156	T-Tube Connector ID6.4
11	1	5320-0003	3-position/6-port FI valve, MP35N, 1300 bar
12	1	5005-0072	Capillary MP35N 0.12 mm x 160 mm SL/S
13	1	5005-0069	Capillary MP35N 0.17 mm x 160 mm SL/SL
14	3	G4220-60007	Bottle Head Assembly
	1	5005-0071	Capillary MP35N 0.17 mm x 500 mm SL/SL (not shown)
	1	G3167-68300	Waste Tube PTFE, 0.70 mm x 180 mm (not shown)
	3	5043-1013	Tubing Clip IF-II (not shown)
	1	5067-5967	Tubing Clip Tube Connector (not shown)

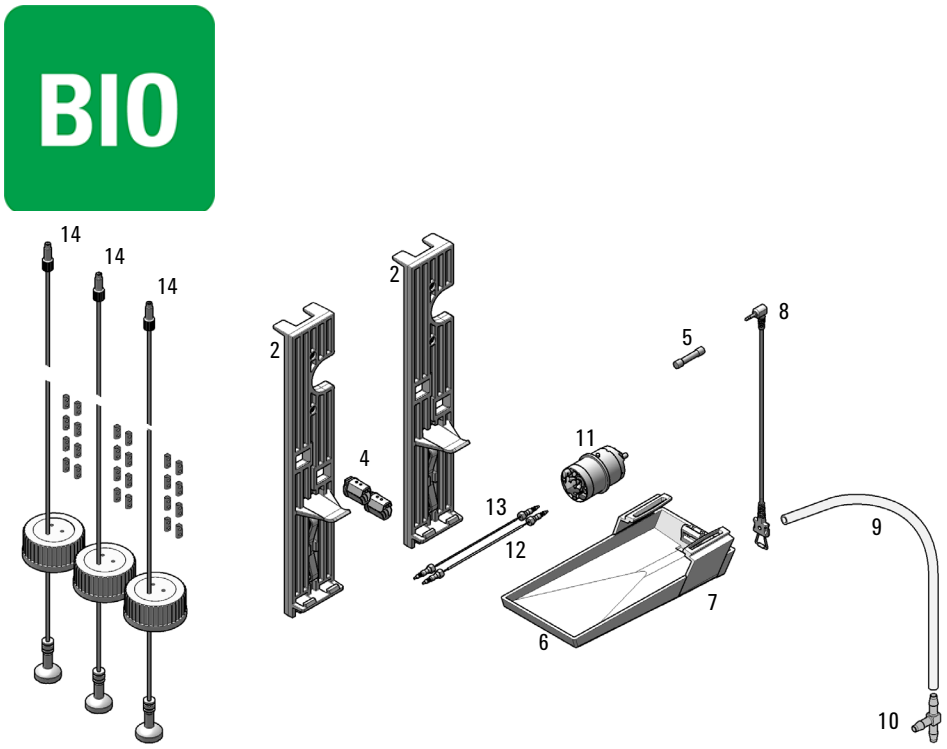


Figure 40 1290 Infinity II Bio Online Sample Manager Accessory Kit

Online LC System Checkout Kit

#	p/n	Description
1	G3167-67702	Online LC System Checkout Kit
1	5190-1519	Syringe, 250 µL, Luer lock
1	5190-1550	Needle
1	9301-0407	Syringe, External Valve adapter, SST
1	5062-8535	Waste accessory kit
2	0100-1816	Fitting male PEEK, long

1260 Infinity II Online Sample Manager Capillary Kit

Item	#	p/n	Description
	1	G3167-67000	G3167A Online Sample Manager Capillary Kit
1	1	5500-1159	Capillary ST 0.17 mm x 100 mm SX/S-2.3 PS Capillary
2	1	5500-1234	Capillary ST 0.17 mm x 180 mm MD Capillary
3	2	5067-5403	UHP fitting
4	1	5004-0011	Capillary ST 0.12 mm x 160 mm SL/SL Transfer Capillary I
5	1	5005-0057	Capillary ST 0.17 mm x 160 mm SL/SL Transfer Capillary II
6	1	5067-5709	Capillary ST 0.25 mm x 250 mm SL/SL FH Capillary

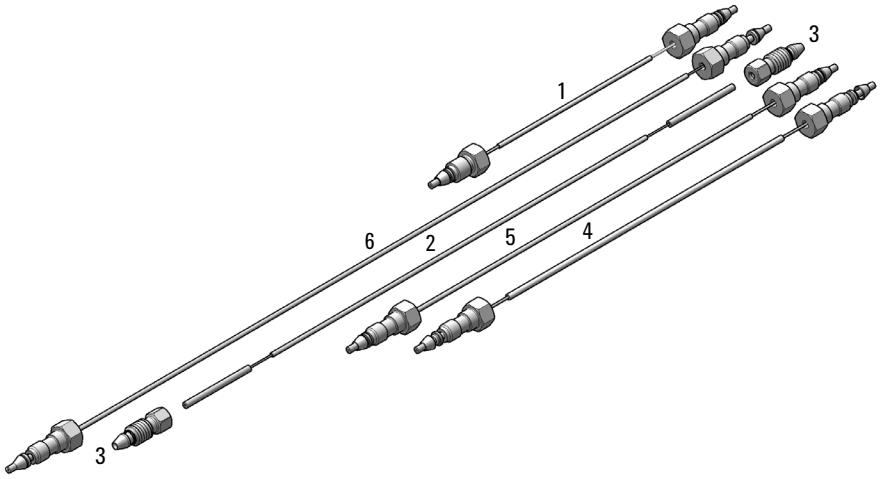


Figure 41 G3167A Online Sample Manager Capillary Kit

1290 Infinity II Bio Online Sample Manager Capillary Kit

BIO

For 1290 Infinity II Bio LC modules, use bio / biocompatible parts only.
Do not mix parts between 1260 Infinity II Bio-Inert LC modules and 1290 Infinity II Bio LC modules.

Item	#	p/n	Description
	1	G3167-67002	G3167B Online Sample Manager Capillary Kit
1	1	5500-1278	Capillary MP35N 0.17 mm x 100 mm SL/SL PS Capillary
2	1	5005-0073	Capillary MP35N 0.17 mm x 180 mm MD Capillary
3	2	5067-5403	UHP fitting
4	1	5005-0069	Capillary MP35N 0.17 mm x 160 mm SL/SL Transfer Capillary I
5	1	5005-0072	Capillary MP35N 0.12 mm x 160 mm SL/S Transfer Capillary II
6	1	5005-0074	Capillary MP35N 0.25 mm x 250 mm SL/SL FH Capillary

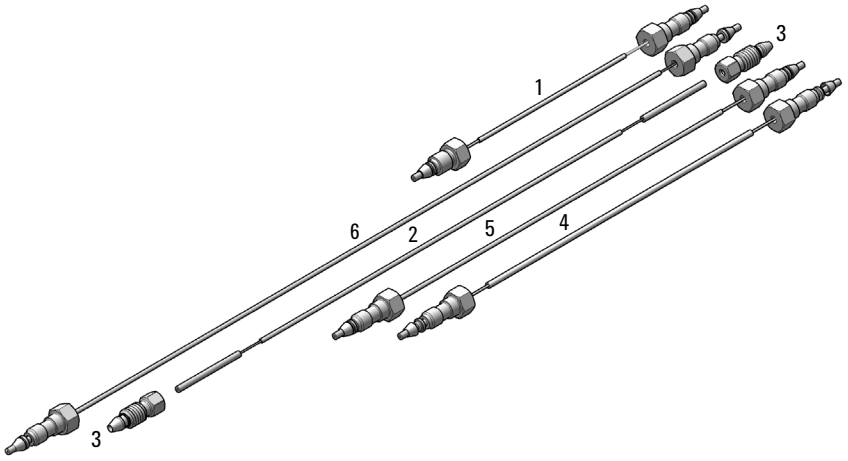


Figure 42 G3167B Online Sample Manager Capillary Kit

1260 Infinity II Online Sample Manager Set PM Kit

Item	#	p/n	Description
	1	G3167-67001	G3167AA Online Sample Manager Set PM Kit
1	1	G4267-87201	Needle Assembly
2	1	G3167-60018	Needle Seat Capillary, ST 0.17 mm x 230 mm SL/SL (UHP fitting (5067-5403) is shown as pre-installed but included as a separate part)
3	2	5068-0279	Rotor Seal, 3-position/6-port FI Valve, 800 bar
4	1	5067-5918	Flush Head Seal 500 µL

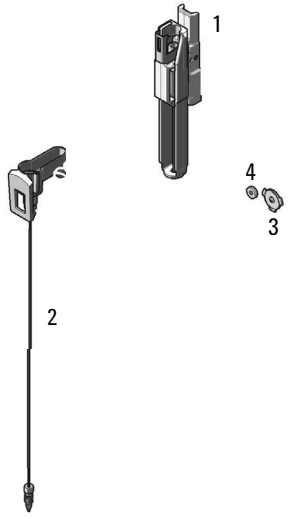


Figure 43 G3167AA Online Sample Manager Set PM Kit

1290 Infinity II Bio Online Sample Manager Set PM Kit

BIO

For 1290 Infinity II Bio LC modules, use bio / biocompatible parts only.
Do not mix parts between 1260 Infinity II Bio-Inert LC modules and 1290 Infinity II Bio LC modules.

Item	#	p/n	Description
	1	G3167-67003	G3167BA Online Sample Manager Set PM Kit
1	1	G7137-87201	Needle Biocompatible
2	1	G3167-60017	Needle Seat Capillary, Bio 0.17 mm x 230 mm (UHP fitting (5067-5403) is shown as pre-installed but included as a separate part)
3	2	5320-0005	Rotor Seal, 3-position/6-port FI Valve, MP35N, 1300 bar
4	1	G5668-60494	Flush Head Seal 500 µL Bio

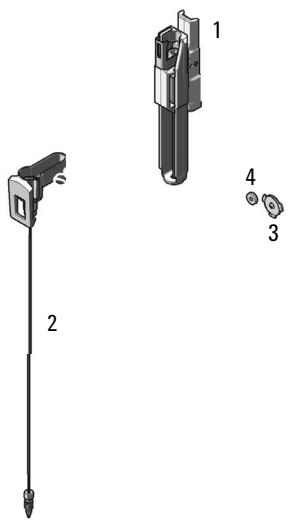
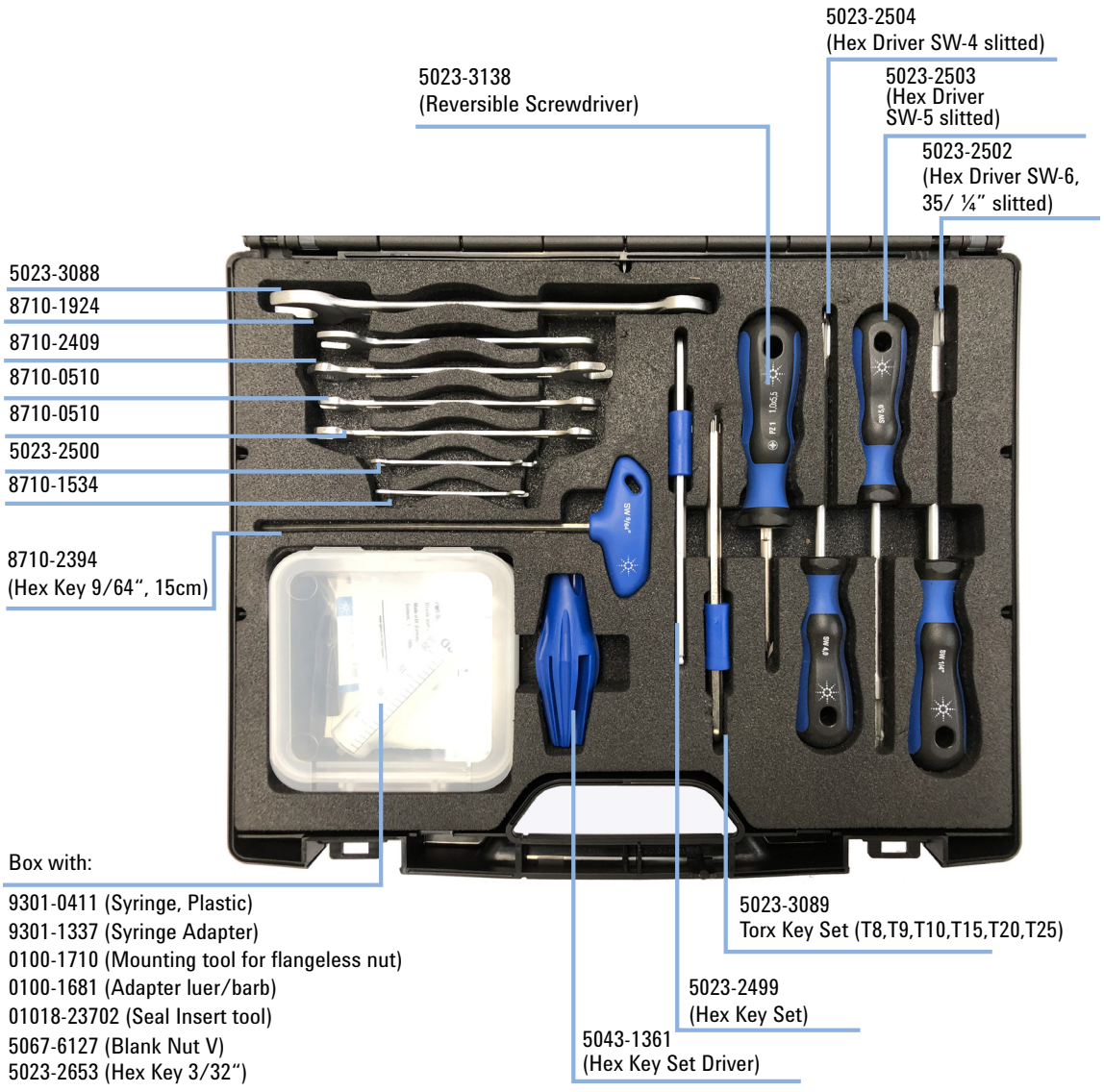


Figure 44 G3167BA Online Sample Manager Set PM Kit

Tool Kit

G7120-68708 InfinityLab System Tool Kit



System Convenience Kits

p/n	Description
5067-6617	InfinityLab convenience kit, for 1260 Infinity II LC

includes:

- solvent bottles 1 L (3 clear, 1 amber),
- identification rings and removable stickers for solvent bottles,
- vials (2 mL) clear with bonded preslit caps (500/pk),
- solvent inlet filters stainless steel (4/pk),
- inline filter kit, multifunction tool,
- Stay Safe cap starter kit, and
- complete contents of 1260 Infinity II capillary kit (5067-6614)

p/n	Description
5067-6614	InfinityLab capillary kit, 0.17 mm, for 1260 Infinity II LC

includes:

- complete set of system capillaries,
- Quick Connect and Quick Turn fittings,
- PEEK finger-tight fittings,
- stainless steel restriction capillary, and
- blank nut

Infinity Lab Quick Connect and Quick Turn Fittings

InfinityLab Quick Connect Fittings

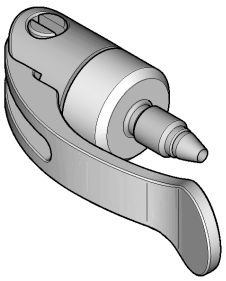


Figure 45 InfinityLab Quick Connect Fitting

p/n	Description
5067-5965	InfinityLab Quick Connect LC fitting (fitting without preinstalled capillary)
5043-0924	Front Ferrule for Quick Connect/Turn Fitting
5067-5961	InfinityLab Quick Connect Assy ST 0.075 mm x 105 mm
5067-6163	InfinityLab Quick Connect Assy ST 0.075 mm x 150 mm
5067-6164	InfinityLab Quick Connect Assy ST 0.075 mm x 220 mm
5067-6165	InfinityLab Quick Connect Assy ST 0.075 mm x 280 mm
5067-5957	InfinityLab Quick Connect Assy ST 0.12 mm x 105 mm
5067-5958	InfinityLab Quick Connect Assy ST 0.12 mm x 150 mm
5067-5959	InfinityLab Quick Connect Assy ST 0.12 mm x 220 mm
5067-5960	InfinityLab Quick Connect Assy ST 0.12 mm x 280 mm
5067-6166	InfinityLab Quick Connect Assy ST 0.17 mm x 105 mm
5067-6167	InfinityLab Quick Connect Assy ST 0.17 mm x 150 mm
5067-6168	InfinityLab Quick Connect Assy ST 0.17 mm x 220 mm
5067-6169	InfinityLab Quick Connect Assy ST 0.17 mm x 280 mm

InfinityLab Quick Connect Fitting Replacement Capillaries

p/n	Description
5500-1174	InfinityLab Capillary ST 0.075 mm x 105 mm
5500-1175	InfinityLab Capillary ST 0.075 mm x 150 mm
5500-1176	InfinityLab Capillary ST 0.075 mm x 220 mm
5500-1177	InfinityLab Capillary ST 0.075 mm x 250 mm
5500-1178	InfinityLab Capillary ST 0.075 mm x 280 mm
5500-1173	InfinityLab Capillary ST 0.12 mm x 105 mm
5500-1172	InfinityLab Capillary ST 0.12 mm x 150 mm
5500-1171	InfinityLab Capillary ST 0.12 mm x 220 mm
5500-1170	InfinityLab Capillary ST 0.12 mm x 280 mm
5500-1179	InfinityLab Capillary ST 0.12 mm x 400 mm
5500-1180	InfinityLab Capillary ST 0.12 mm x 500 mm
5500-1181	InfinityLab Capillary ST 0.17 mm x 105 mm
5500-1182	InfinityLab Capillary ST 0.17 mm x 150 mm
5500-1183	InfinityLab Capillary ST 0.17 mm x 220 mm
5500-1230	InfinityLab Capillary ST 0.17 mm x 280 mm
5500-1231	InfinityLab Capillary ST 0.17 mm x 500 mm
5500-1259	InfinityLab Capillary ST 0.25 mm x 150 mm
5500-1260	InfinityLab Capillary ST 0.25 mm x 400 mm

InfinityLab Quick Turn Fitting

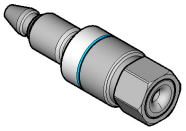


Figure 46 InfinityLab Quick Turn Fitting

p/n	Description
5067-5966	InfinityLab Quick Turn Fitting
5043-0924	Front Ferrule for Quick Connect/Turn Fitting

Capillaries for use with the InfinityLab Quick Turn Fitting

p/n	Description
5500-1198	Capillary ST 0.075 mm x 105 mm, long socket
5500-1232	Capillary ST 0.075 mm x 150 mm, long socket
5500-1206	Capillary ST 0.075 mm x 250 mm, long socket
5500-1205	Capillary ST 0.075 mm x 500 mm, long socket
5500-1188	Quick Turn Capillary ST 0.12 mm x 105 mm, long socket
5500-1189	Capillary ST 0.12 x 150 mm, long socket
5500-1233	Capillary ST 0.12 mm x 180 mm, long socket
5500-1190	Capillary ST 0.12 mm x 200 mm, long socket
5500-1191	InfinityLab Quick Turn Capillary ST 0.12 mm x 280 mm, long socket
5500-1192	Capillary ST 0.12 mm x 500 mm, long socket
5500-1193	InfinityLab Quick Turn Capillary ST 0.17 mm x 105 mm, long socket
5500-1194	Capillary ST 0.17 mm x 150 mm, long socket
5500-1234	Capillary ST 0.17 mm x 180 mm
5500-1195	Capillary ST 0.17 mm x 200 mm, long socket
5500-1196	Capillary ST 0.17 mm x 280 mm, long socket
5500-1235	Capillary ST 0.17 mm x 380 mm, long socket
5500-1236	Capillary ST 0.17 mm x 400 mm, long socket
5500-1197	Capillary ST 0.17 mm x 500 mm, long socket
5500-1237	Capillary 0.17 mm x 700 mm, ns/ns
5500-1262	Capillary 0.25 mm x 150 mm, ns/ns
5500-1263	Capillary ST 0.25 mm x 400 mm, long socket
5500-1200	Quick Turn Capillary ST 0.12 mm x 130 mm SL/M
5500-1288	Capillary ST 0.12 mm x 150 mm, long socket, M4
5500-1290	Capillary ST 0.17 mm x 150 mm, long socket, M4

Safety Caps and Solvent Bottles

Stay Safe Caps

Table 8 Stay Safe Caps

Part No.	Description	Fittings	Vent Ports	Filter Ports	Waste Ports
5043-1217	GL45 with 1 port 1 vent valve with time strip	1 x 3.2 mm	1		
5043-1218	GL45 with 2 ports 1 vent valve with time strip	2 x 3.2 mm	1		
5043-1219	GL45 with 3 ports 1 vent valve with time strip	3 x 3.2 mm	1		
5043-1220	GL45 with 4 ports 1 leak hose	4 (2 x 3.2 mm, 1 x 2.3 mm, 1 x 1.6 mm)		1	1

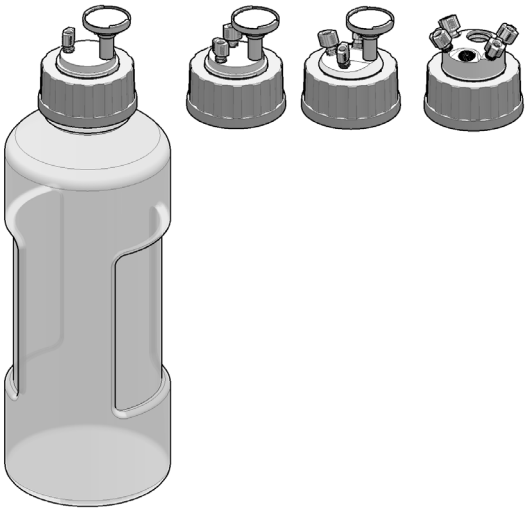


Figure 47 Solvent bottle with different types of Stay Safe caps

Kits

p/n	Description
5043-1221	6 L waste can with 1 Stay Safe cap GL45 with 4 ports

Figure 48 Kit: Waste can with Stay Safe cap

Solvent Bottles

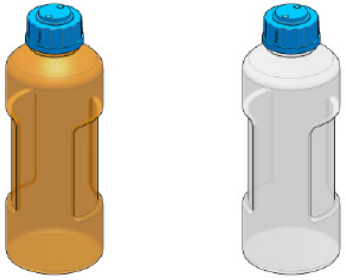


Figure 49 Solvent bottles

p/n	Description
9301-6523	Solvent bottle, clear, 500 mL with cap
9301-6524	Solvent bottle, clear, 1000 mL
9301-6525	Solvent bottle, amber, 500 mL with cap
9301-6526	Solvent bottle, amber, 1000 mL
9301-6527	Solvent bottle, clear, 125 mL
9301-6528	Solvent bottle, clear, 1000 mL with cap
9301-6529	Identification silicone ring (8/pk with 4 different colors)
9301-6530	Sticker for solvent bottles (100/pk)

Additional Parts

For fitting ports:

p/n	Description
5043-1216	Fitting for 3.2 mm tubing, PFA, 2/pk
5043-1215	Fitting for 2.3 mm tubing, PFA, 2/pk
5043-1214	Fitting for 1.6 mm tubing, PFA, 2/pk
5043-1198	Screw plug 1/8 in, PTFE, 2/pk

For vent port:

p/n	Description
5043-1190	Venting valve with time strip, PTFE, 1 µm

For filter port:

p/n	Description
5043-1193	Charcoal filter with time strip (58 g) for waste container

For waste port:

p/n	Description
5043-1207	2-ports waste collector, PTFE

Miscellaneous:

p/n	Description
5043-1191	Thread adapter PTFE GL45 (M) - GL40 (F)
5043-1192	Thread adapter PTFE GL45 (M) - GPI 38-430 (F)

InfinityLab Flex Bench Family

InfinityLab Flex Bench

p/n	Description
5043-1252	InfinityLab Flex Bench
5043-1759	InfinityLab Flex Bench with pre-assembled power strip

The Flex Bench includes the framework, four shelf assemblies, and one waste bin.

Accessories:

p/n	Description
5043-1287	Shelf assembly
8121-1245	Valve shelf assembly
5043-1278	Waste bin
8121-2258	Power cord
5043-1289	InfinityLab Flex Bench Replacement Kit (spare parts: screws and casters)

InfinityLab Benchtop

p/n	Description
5043-1711	InfinityLab Benchtop
5043-1740	InfinityLab Benchtop with pre-assembled power strip

The Benchtop includes the framework and three shelf assemblies.

Accessories:

p/n	Description
5043-1750	Shelf assembly
8121-1245	Valve shelf assembly
8121-2258	Power cord
5043-1289	InfinityLab Flex Bench Replacement Kit (spare parts: screws and casters)

5 Appendix

This chapter provides additional information on safety, legal, and web.

Safety

General Safety Information

General Safety Information

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

WARNING

Ensure the proper usage of the equipment.

The protection provided by the equipment may be impaired.

✓ **The operator of this instrument is advised to use the equipment in a manner as specified in this manual.**

Safety Standards

This is a Safety Class I instrument (provided with terminal for protective earthing) and has been manufactured and tested according to international safety standards.

General

Do not use this product in any manner not specified by the manufacturer. The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

Before Applying Power

WARNING

Wrong voltage range, frequency or cabling

Personal injury or damage to the instrument

- ✓ **Verify that the voltage range and frequency of your power distribution matches to the power specification of the individual instrument.**
- ✓ **Never use cables other than the ones supplied by Agilent Technologies to ensure proper functionality and compliance with safety or EMC regulations.**
- ✓ **Make all connections to the unit before applying power.**

NOTE

Note the instrument's external markings described under "Symbols" on page 140.

Ground the Instrument

WARNING

Missing electrical ground

Electrical shock

- ✓ **If your product is provided with a grounding type power plug, the instrument chassis and cover must be connected to an electrical ground to minimize shock hazard.**
- ✓ **The ground pin must be firmly connected to an electrical ground (safety ground) terminal at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.**

Do Not Operate in an Explosive Atmosphere

WARNING

Presence of flammable gases or fumes

Explosion hazard

- ✓ **Do not operate the instrument in the presence of flammable gases or fumes.**

Do Not Remove the Instrument Cover

WARNING

Instrument covers removed

Electrical shock

- ✓ **Do Not Remove the Instrument Cover**
- ✓ **Only Agilent authorized personnel are allowed to remove instrument covers. Always disconnect the power cables and any external circuits before removing the instrument cover.**

Do Not Modify the Instrument

Do not install substitute parts or perform any unauthorized modification to the product. Return the product to an Agilent Sales and Service Office for service and repair to ensure that safety features are maintained.

In Case of Damage

WARNING

Damage to the module

Personal injury (for example electrical shock, intoxication)

- ✓ **Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.**

Solvents

WARNING

Toxic, flammable and hazardous solvents, samples and reagents

The handling of solvents, samples and reagents can hold health and safety risks.

- ✓ **When working with these substances observe appropriate safety procedures (for example by wearing goggles, safety gloves and protective clothing) as described in the material handling and safety data sheet supplied by the vendor, and follow good laboratory practice.**
- ✓ **Do not use solvents with an auto-ignition temperature below 200 °C (392 °F). Do not use solvents with a boiling point below 56 °C (133 °F).**
- ✓ **Avoid high vapor concentrations. Keep the solvent temperature at least 40 °C (72 °F) below the boiling point of the solvent used. This includes the solvent temperature in the sample compartment. For the solvents methanol and ethanol keep the solvent temperature at least 25 °C (45 °F) below the boiling point.**
- ✓ **Do not operate the instrument in an explosive atmosphere.**
- ✓ **Do not use solvents of ignition Class IIC according IEC 60079-20-1 (for example, carbon disulfide).**
- ✓ **Reduce the volume of substances to the minimum required for the analysis.**
- ✓ **Never exceed the maximum permissible volume of solvents (8 L) in the solvent cabinet. Do not use bottles that exceed the maximum permissible volume as specified in the usage guideline for solvent cabinet.**
- ✓ **Ground the waste container.**
- ✓ **Regularly check the filling level of the waste container. The residual free volume in the waste container must be large enough to collect the waste liquid.**

To achieve maximal safety, regularly check the tubing for correct installation.

NOTE

For details, see the usage guideline for the solvent cabinet. A printed copy of the guideline has been shipped with the solvent cabinet, electronic copies are available in the Agilent Information Center or via the Internet.

Symbols

Table 9 Symbols

	The apparatus is marked with this symbol when the user shall refer to the instruction manual in order to protect risk of harm to the operator and to protect the apparatus against damage.
	Indicates dangerous voltages.
	Indicates a protected ground terminal.
	The apparatus is marked with this symbol when hot surfaces are available and the user should not touch it when heated up.
	Sample Cooler unit is designed as vapor-compression refrigeration system. Contains fluorinated greenhouse gas (refrigerant) according to the Kyoto protocol. For specifications of refrigerant, charge capacity, carbon dioxide equivalent (CDE), and global warming potential (GWP) see instrument label.
	Flammable Material For Sample Thermostat which uses flammable refrigerant consult Agilent Information Center / User Manual before attempting to install or service this equipment. All safety precautions must be followed.
	Confirms that a manufactured product complies with all applicable European Community directives. The European Declaration of Conformity is available at: **http://regulations.corporate.agilent.com/DoC/search.htm**
	Manufacturing date.
	Power symbol indicates On/Off. The apparatus is not completely disconnected from the mains supply when the power switch is in the Off position
	Pacemaker Magnets could affect the functioning of pacemakers and implanted heart defibrillators. A pacemaker could switch into test mode and cause illness. A heart defibrillator may stop working. If you wear these devices keep at least 55 mm distance to magnets. Warn others who wear these devices from getting too close to magnets.

Table 9 Symbols

	Magnetic field Magnets produce a far-reaching, strong magnetic field. They could damage TVs and laptops, computer hard drives, credit and ATM cards, data storage media, mechanical watches, hearing aids and speakers. Keep magnets at least 25 mm away from devices and objects that could be damaged by strong magnetic fields.
	Indicates a pinching or crushing hazard
	Indicates a piercing or cutting hazard.

WARNING

A WARNING

alerts you to situations that could cause physical injury or death.

- ✓ **Do not proceed beyond a warning until you have fully understood and met the indicated conditions.**

CAUTION

A CAUTION

alerts you to situations that could cause loss of data, or damage of equipment.

- ✓ **Do not proceed beyond a caution until you have fully understood and met the indicated conditions.**

Electrical and chemical Hazards specific to the System

Equipotential grounding

CAUTION

Different potential grounding of reactor and LC instrument

Electronic failure and damage to the instrument by melting capillaries

- ✓ **Ensure the equipotential grounding of all instruments.**
- ✓ **Use capillaries made of nonconductive material.**

Increased touch current

WARNING

Combination of Online LC system and external reactor installation

Personal injury by increased touch current

- ✓ **Verify that the current range matches the specifications of the system.**
- ✓ **To ensure proper functionality and compliance with safety or EMC regulations, use the multiple socket outlet distributed by Agilent Technologies only.**

Chemicals from Reactor stream

WARNING

Hazardous chemicals and vapors from reactor stream

Exposure with hazardous chemicals and vapors can hold health and safety risks

- ✓ **Verify the correct installation of all components.**
- ✓ **Use a leak tray with leak sensor for the external valve.**
- ✓ **Locate the system in an appropriate safety area isolated from office facilities.**
- ✓ **Ensure that the leak handling system accounts for toxic samples and provides a separate waste container for the external valve.**
- ✓ **Do not exceed the pressure limits specified for the reactor stream.**
- ✓ **Consider the specifications for the samples to be collected to avoid blockage of the reactor stream flow path.**

Vial Handling

WARNING

Hazardous chemicals and vapors from the reactor stream

Exposure with hazardous chemicals and vapors can hold health and safety risks

- ✓ **Always insert correct vials into the module.**
- ✓ **Use the vial presence sensing technology.**
- ✓ **Ensure that the installed vials are appropriate for the volume of the collected sample.**

Flammable Solvents from the Reactor stream

WARNING

Leak of flammable solvents

Explosive hazard and personal injury

- ✓ Verify the correct installation of all components.
- ✓ Use a leak tray with leak sensor for the external valve.
- ✓ Locate the system in an appropriate safety area.
- ✓ Ensure that the leak handling system accounts for toxic samples and provides a separate waste container for the external valve.
- ✓ Do not exceed the pressure limits specified for the reactor stream.
- ✓ Consider the specifications for the samples to be collected to avoid blockage of the reactor stream flow path.

Flammable Solvents in Vials

WARNING

Leak of flammable solvents

Explosive hazard and personal injury

- ✓ Always insert correct vials into the module.
- ✓ Use the vial presence sensing technology.
- ✓ Ensure that the installed vials are appropriate for the volume of the collected sample.

Waste Electrical and Electronic Equipment Directive

This product complies with the European WEEE Directive marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste.

NOTE

Do not dispose of in domestic household waste

To return unwanted products, contact your local Agilent office, or see **https://www.agilent.com** for more information.

Radio Interference

Cables supplied by Agilent Technologies are screened to provide optimized protection against radio interference. All cables are in compliance with safety or EMC regulations.

Test and Measurement

If test and measurement equipment is operated with unscreened cables, or used for measurements on open set-ups, the user has to assure that under operating conditions the radio interference limits are still met within the premises.

Sound Emission

Sound pressure

Sound pressure Lp <70 db(A) according to DIN EN ISO 7779

Schalldruckpegel

Schalldruckpegel Lp <70 db(A) nach DIN EN ISO 7779

Solvent Information

Flow Cell

To protect optimal functionality of your flow-cell:

- Avoid the use of alkaline solutions (pH > 9.5) which can attack quartz and thus impair the optical properties of the flow cell.

Use of Solvents

Observe the following recommendations on the use of solvents.

- Brown glass ware can avoid growth of algae.
- Avoid the use of the following steel-corrosive solvents:
  - solutions of alkali halides and their respective acids (for example, lithium iodide, potassium chloride, and so on),
  - high concentrations of inorganic acids like sulfuric acid and nitric acid, especially at higher temperatures (if your chromatography method allows, replace by phosphoric acid or phosphate buffer which are less corrosive against stainless steel),
  - halogenated solvents or mixtures which form radicals and/or acids, for example:

    $2CHCl_3 + O_2 \rightarrow 2COCl_2 + 2HCl$

    This reaction, in which stainless steel probably acts as a catalyst, occurs quickly with dried chloroform if the drying process removes the stabilizing alcohol,
  - chromatographic grade ethers, which can contain peroxides (for example, THF, dioxane, diisopropyl ether) should be filtered through dry aluminium oxide which adsorbs the peroxides,
  - solvents containing strong complexing agents (e.g. EDTA),
  - mixtures of carbon tetrachloride with 2-propanol or THF.
- Avoid the use of dimethyl formamide (DMF). Polyvinylidene fluoride (PVDF), which is used in leak sensors, is not resistant to DMF.

UV Radiation

Emissions of ultraviolet radiation (200 – 315 nm) from this product is limited such that radiant exposure incident upon the unprotected skin or eye of operator or service personnel is limited to the following TLVs (Threshold Limit Values) according to the American Conference of Governmental Industrial Hygienists:

Table 10 UV radiation limits

Exposure/day	Effective irradiance
8 h	0.1 µW/cm^2
10 min	5.0 µW/cm^2

Typically the radiation values are much smaller than these limits:

Table 11 UV radiation typical values

Position	Effective irradiance
Lamp installed, 50 cm distance	average 0.016 µW/cm^2
Lamp installed, 50 cm distance	maximum 0.14 µW/cm^2

Declaration of Conformity for HOX2 Filter

Declaration of Conformity

We herewith inform you that the

Holmium Oxide Glass Filter

used in Agilents absorbance detectors listed in the table below meets the requirements of National Institute of Standards and Technology (NIST) to be applied as certified wavelength standard.

According to the publication of NIST in J. Res. Natl. Inst. Stand. Technol. 112, 303-306 (2007) the holmium oxide glass filters are inherently stable with respect to the wavelength scale and need no recertification. The expanded uncertainty of the certified wavelength values is 0.2 nm.

Agilent Technologies guarantees, as required by NIST, that the material of the filters is holmium oxide glass representing the inherently existent holmium oxide absorption bands.

Test wavelengths:

Where "x" can be any alphanumeric character

Product Number	Series	Measured Wavelength *	Wavelength Accuracy	Optical Bandwidth
G1315x, G1365x	1100, 1200, 1260	361.0 nm 418.9 nm 453.7 nm 536.7 nm	+/- 1 nm	2 nm
G7115x, G7165x	1260			
G1600x, G7100x	CE			
G1314x	1100, 1200, 1260, 1290	360.8nm 418.5nm 536.4nm	+/- 1 nm	6 nm
G7114x	1260, 1290			
G4286x,..., 94x	1120, 1220			

*) The variation in Measured Wavelength depends on the different Optical Bandwidth.

28-Oct-2014

(Date)

Thomas Jour

(R&D Manager)

Stephan Baumbach

(Quality Manager)

P/N 89550-90501

Revision: G
Effective by: 28-Oct-2014

Capillary Connections

Capillaries and connections for generic LC systems. For detailed information about the capillary connections of the Online Sample Manager Set, see *Agilent InfinityLab Online LC Solution User Manual*.

Table 12 Recommended capillary connections for 1260 Infinity II systems

p/n	From	To
Bottle Head Assembly (G7120-60007)	Solvent Bottle	Infinity II Pump
Capillary ST 0.17 mm x 500 mm SI/SI (5500-1246)	Pump	Sampler
Capillary, ST, 0.17 mm x 900 mm SI/SX (5500-1217)	Pump	Vialsampler with ICC
Capillary ST 0.17 mm x 500 mm SI/SI (5500-1246)	Multisampler / Online Sample Manager	MCT Valve/Heat Exchanger
Capillary, ST, 0.17 mm x 400 mm SL/SL (5500-1252)	Vialsampler	MCT Valve/Heat Exchanger
Capillary ST 0.17 mm x 105 mm SL/SL (5500-1240)	Vialsampler	ICC Heat Exchanger
Capillary, ST, 0.17 mm x 120 mm SL/SL, long socket (5500-1250)	ICC Heat Exchanger	Column
InfinityLab Quick Turn Capillary ST 0.17 mm x 105 mm, long socket (5500-1193)	MCT Heat Exchanger	Column
InfinityLab Quick Turn Capillary ST 0.12 mm x 280 mm, long socket (5500-1191)	Column/MCT Valve	Detector
Waste accessory kit (5062-8535)	VWD	Waste
Tube PTFE 0.7 mm x 5 m, 1.6 mm od (5062-2462)	DAD/FLD	Waste
Analytical tubing kit 0.25 mm i.d. PTFE-ESD (G5664-68712)	Detector	Fraction Collector

Table 13 Recommended capillary connections for 1290 Infinity II Bio LC

p/n	From	To
Bottle Head Assembly (G7120-60007)	Solvent Bottle	Infinity II Pump
Capillary MP35N 0.17 mm x 500 mm, SI/SI (5500-1419)	Pump	Multisampler/Online Sample Manager
Capillary MP35N 0.12 mm x 500 mm SI/SI (5500-1279)	Multisampler/Online Sample Manager	MCT
Quick Connect Capillary MP35N 0.12 mm x 105 mm (5500-1578)	MCT Heat Exchanger	Column
Quick Turn Capillary MP35N 0.12 mm x 280 mm (5500-1596)	Column/MCT Valve	Detector (DAD)
Quick Turn Capillary MP35N 0.12 mm x 500 mm (5500-1598)	Column/MCT Valve	Detector (VWD)
Waste accessory kit (5062-8535)	VWD	Waste
Tube PTFE 0.7 mm x 5 m, 1.6 mm od (5062-2462)	DAD/FLD	Waste
Analytical tubing kit 0.25 mm i.d. PTFE-ESD (G5664-68712)	Detector	Fraction Collector

Agilent Technologies on Internet

For the latest information on products and services visit our worldwide web site on the Internet at:

https://www.agilent.com

In This Book

This book describes the 1260 Infinity II Prime Online LC System and 1290 Infinity II Bio Online LC System.

The manual describes the following:

- Introduction
- Configuration Settings
- Quick Start Guide
- Parts and Consumables
- Appendix

www.agilent.com

Published in Germany
Edition: 07/2023

Part No: G3167-90310 Rev. C
Document No: D0007568 Rev. C

Agilent