VWR
We Enable Science

HITACHI
Inspire the Next

HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY

New Modules

New Accessories

New Improvements

Chromaster

Outstanding performance
Easy-to-use
Robust

HPLC for today and tomorrow

MS Detector is also available

EASY – ACCURATE – COMPACT

Hitachi offers a new MS detector, designed for HPLC users, that is different from existing mass spectrometers.

Outstanding performance

Excellent reproducibility given by a highly stable and robust system.

Pump

Improved gradient performance and the excellent flow rate precision

The Chromaster has a new low-pressure mode called High Frequency Mode (HFM), which utilizes a double switching function of proportioning valves. HFM and the Hitachi high speed realtime feedback control system, greatly suppress liquid pulsation for improved reproducibility of gradient and retention times.

Autosampler

Excellent injection volume precision and low carry-over

The newly adopted high-precision syringe drive unit provides excellent injection volume precision.
Hitachi has eliminated the dead volume in the autosampler flow path, which can cause carry-over and adopted a pumping method that washes the needle outer wall. The result is an accurate autosampler with extremely low carry-over.

Column Oven (5310 Column Oven)

Pre-heating function and a wide temperature control range

The block-type pre-heating function based on Peltier heating and cooling control delivers excellent symmetric and sharp peak shape.
The oven can regulate[*1] temperature from 15 degree below ambient temperature to ambient temperature +60 °C, and can accommodate various columns.

*1 Temperature setting range: 1 to 85 °C.

Diode Array Detector

Excellent qualitative analysis performance, and extremely low noise and low drift.

With a wide wavelength range (190 nm to 900 nm) and excellent resolution (1,024-bit diode array), the Chromaster Diode array detector delivers excellent high-resolution analyses. With a noise level comparable to a UV detector, the Diode array detector is capable of supporting high-sensitivity analyses.
The adoption of a variable air-volume fan and the provision of a specially designed cover on the spectrometer minimize the influence of temperature fluctuations around the optical system and achieves a further reduction in drift.
A variable air-volume fan for the diode array detector and a new cover designed for the spectrometer greatly reduce the temperature change in the detector module.

UV and UV-VIS Detectors

Two-wavelength, simultaneous high-sensitivity detection of drug impurities

The two-wavelength detection function permits measurements at short data acquisition interval of 400 ms[*2] and 800 ms per wavelength, resulting in chromatograms with fine, sharp peak shapes.

*2 The 400 ms interval is available only if the wavelength delta is 160 nm or less.

Thermostat flow cell

The thermostat flow cell[*3] minimizes the influence of ambient temperature changes.
As a result, the detector baseline is steady and data reliability is improved.

*3 Optional

Easy-to-use with excellent reproducibility

Beyond the simplicity of operation and ease of use, a critical requirement for HPLC is ease of maintenance.

GUI controller

Provides an attractive user interface and permits the operation of modules on a stand-alone basis.

The GUI controller*4 comprises a color LCD monitor and a touch-panel system for ease of operation. (Some modules are not compatible.)

*4 Optional

Auto-purge function

Startup tasks of pump, simplified

From Chromatography Data Station (CDS), GUI Controller, and UI Pad*5, you can set any flow rate (9,999 ml / min max.) and running time (30 minutes max.) so that the pump can be purged automatically. (Pumps with or without auto-purge valve are available.)

*5 See p. 22.

Auto-plunger washing function

Prevents the precipitation of salts onto the plunger surface.

As a standard, Chromaster includes a washing mechanism that prevents damage to the pump seal or the plunger by salt precipitation from the mobile phase. A combination of Plunger Washing Pump*6 and CDS permits automatic washing after each analysis run.

*6 Optional

Low-volume degassing unit

Shorter solvent purging time

The low-volume (480 µl / ch) degassing unit reduces solvent purging time for pump and autosampler, and reduces the amount of solvent used. The degassing unit has a 6-channel flow path: four solvents for the pump and two for the autosampler.

Autosampler with thermostat (5260 Autosampler)

Capable of heating up to 45 °C

The Autosampler with thermostat is capable of controlling the temperature (in a vial) from 21 °C below ambient temperature to ambient temperature + 25 °C*7. This level of vial temperature control broadens the application range and maintains sample stability by preventing crystallization of sample components in the vial. (Autosamplers are available with and without a thermostat.)

*7 Temperature setting range: 1 to 45 °C

Dedicated degassing unit for autosampler (5260 Autosampler)

Space-saving built-in degassing unit

The Chromaster autosampler incorporates a dedicated degassing unit*8. When the user wants to operate the Chromaster autosampler without Chromaster pump, this degassing unit has great utility. Moreover, because it can be a built-in unit, the degassing unit does not take up extra bench space.

*8 Optional

A specially designed cover for the spectrometer and a variable air-volume fan

Reduced lamp stabilization time (Diode array detector)

A variable air-volume fan for the diode array detector and a new cover designed for the spectrometer greatly reduce the temperature change in the detector module. The result is a 30% reduction[*9] in lamp stabilization time.

*9 in-house comparison

Column oven (5310 Column Oven)

Easily accommodates a 300 mm analytical column fitted with a guard-column

The door, which opens in an L-shape pattern and with internal dimensions 375 mm wide and 114 mm high, facilitates the connection and stowing tasks for a guard-column and column. The oven can accommodate up to three 300 mm columns.

Column management system

Column log information is saved in the ID tag

The Chromaster column management system[*10] manages the Log information on analytical columns and guard-columns from any manufacturer.
Log information can be written and read through a connector or a PC USB port mounted on the column oven. ID Tags can be used repeatedly.

*10 Optional

Solvent cabinet with a power supply box

A large space for a number of bottles in one place.

The following solvent bottles can be mounted on the organizer (a solvent cabinet with a power supply box):

Example
3,785 l (U.S. gallon bottle) × 2 + 500 ml × 2
3,0 l (Japanese gallon bottle) × 2 + 500 ml × 2
2,5 l (EU gallon bottle) × 2 + 500 ml × 3
1,0 l bottle × 5 + 500 ml × 2

System size

Reduced height and minimized footprint

Most optional accessories are internally mounted to reduce HPLC system height. At the same time, the handle located on the front side of the organizer moves vertically for easy access to solvent bottles. With a module width of 340 mm[*11] and a depth of 440 mm, the system provides space savings.

*11 Exclusive of the column oven

Robust

The Hitachi reputation for instrument robustness and reliability continues with the Chromaster, which is made using stronger materials and is manufactured according to Hitachi's strict quality control standards.

Designed for longevity

The external covers are made of heat-resistant, chemical-tolerant, and UV irradiation-withstanding materials. The internal walls of the module are made with stainless steel for the prevention of corrosion owing to humidity and solvent vapors often present in a system. To minimize any adverse effect on the module in the event of solvent leakage, the system incorporates a designed flow path.

Other functions

- The autosampler has a door lock mechanism for safety (5260 Autosampler).
- During the lamp replacement operation, power is automatically shut off.
- A leak sensor is installed in all modules.
- To guard against any leakage of non-volatile solvents in the column oven, the column oven incorporates a solvent leak sensor and a gas sensor.

Introducing the Chromaster® modules

Fulfilling the user's needs

- Data reliability
- Intuitive operation based on an LCD touch panel
- Attention to details
- Ease of maintenance

UHPLC entry-level model with a wide application range for HPLC users

The lineup for Chromaster includes 5160 pump and 5260/5280 autosamplers that are compatible not only with conventional 40 MPa system but also with 60 MPa system. The 60 MPa system, which can be used with columns containing 2,0 µm or smaller particles, and core-shell columns, is capable of conventional HPLC analyses and also ensures improved resolution performance and shorter analysis time.

Analysis Example from the Chromaster 60 MPa System

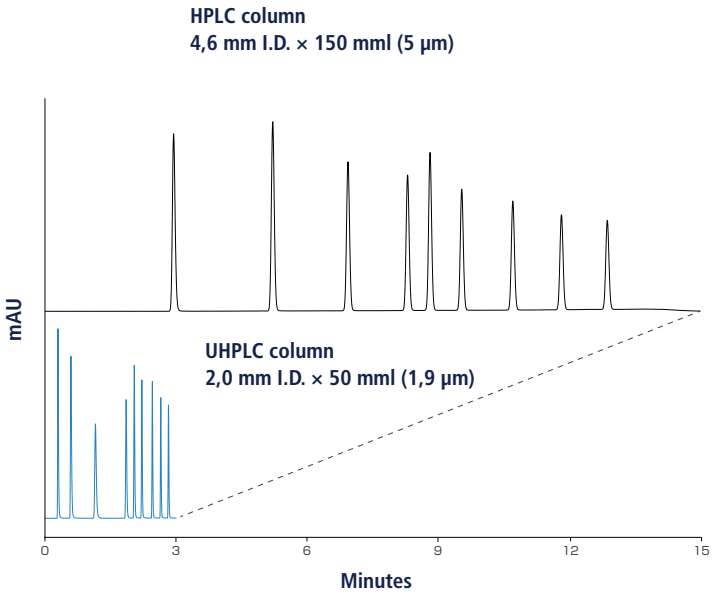
By connecting the Chromaster 60 MPa system to a UHPLC column, high-speed high-resolution analysis can be performed. The 60 MPa system can also be used as an entry-level model for UHPLC.

Conditions

Sample: Alkylphenones
Column: LaChrom II C18 (5 µm) 4,6 mm I.D. × 150 mml
LaChromUltra II C18 (1,9 µm) 2,0 mm I.D. × 50 mml
Column temperature: 40 ˚C
Mobile phase: A:H2O, B:CH3CN
Gradient mode: High Frequency Mode
Wavelength: 247 nm

The following options are used with UHPLC column

- **Low dispersion piping kit**
- **Semi-micro mixer (200 µl)**
- **Semi-micro flow cell unit**



For users of UHPLC columns

To maximize resolution, a UHPLC column with 2.0 µm or smaller particles should be used. For the best resolution performance, diffusion contributions from components outside the column should be addressed. The low diffusion tube kit and semi-micro flow cells are available as optional items.

Chromaster

Improved gradient performance and excellent flow rate precision

5110/5160 Pump

Excellent solvent delivery performance

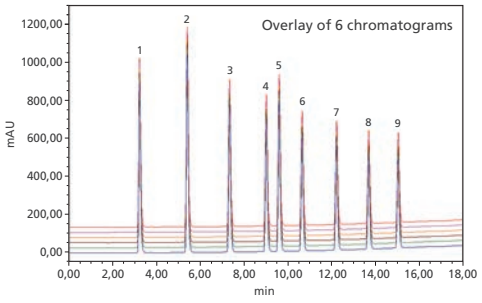
One of the most important performance measures for HPLC is retention time reproducibility.
Excellent gradient performance resulting from the highly accurate solvent delivery by the 5110/5160 pump with Hitachi's unique high-speed feedback real-time control system and High Frequency Mode (HFM) of the proportioning valve make the high retention time reproducibility possible.

Analysis of alkylphenones 9 components
Gradient reproducibility data (retention time) (n=6) (HFM) (Mixer-less)

Conditions

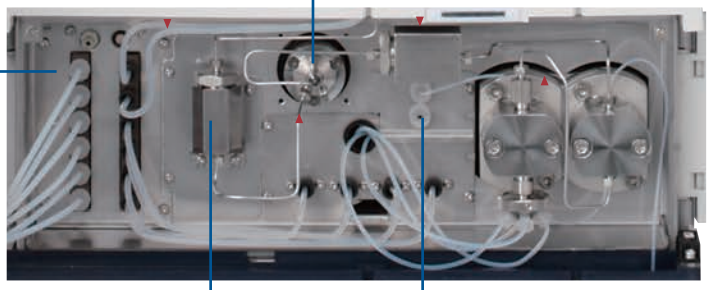
Sample: Alkylphenones
Column: Hitachi LaChrom C18
4,6 mml D × 150 mml (5 µm)
Column temperature: 40 °C
Mobile Phase: A H_2O+ 0,1%TFA
B CH_3CN+ 0,1%TFA
Gradient mode: High Frequent Mode
Gradient: A:B (min) = 65:35 (0) —> 5:95 (15)
—> 5:95 (20) —> 65:35 (20,1)
—> 65:35 (30)
Injection Volume: 10 µl (100 ppm)
Flow rate: 1 ml/min
Detection: 247 nm

		Retention Time	
Peak No.	Component	AVE	%RSD
1	Acetanilide	3,220	0,03
2	Acetophenone	5,397	0,04
3	Propiophenone	7,328	0,03
4	Butyrophenone	9,006	0,02
5	Benzophenone	9,593	0,02
6	Valerophenone	10,642	0,02
7	Hexanophenone	12,214	0,02
8	Heptanophenone	13,679	0,02
9	Octanophenone	15,026	0,02



Pump options

- **6-channel degassing unit (480 µl/ch) (optional)**
  - **4 solvents for pump (Maximum) /2 solvents for autosampler (Maximum)**
- **Auto-purge valve (Pumps with or without Auto-purge valve are available)**
  - **Flow rate setting range (0,001 to 9,999 ml/min) (5110), (0,001 to 5,000 ml/min) (5160)**
  - **Time setting range (1 to 30 min)**



Notes
(1) Plunger washing mechanism: standard
(2) Automatic plunger washing using only Item (1) is subject to the following limitations:
- Requires 5260 Autosampler
- Not compatible with two-solvent washing for the needle inner wall/inside the injection valve on autosampler

Conventional mixer
(Accessory of the low-pressure gradient unit option)
(Can also accept semi-micro/dynamic mixers)
(Can install either of one from three mixers)

- **Plunger washing pump (optional, fitted inside the pump)**
  - **Flow rate setting (1 ml/min, fixed)**
  - **Time setting range (1 to 300 sec)**
  - **Automatic plunger washing function per one analysis available with CDS**

Two types of autosamplers are available to meet customers' needs

5260/5280 Autosampler

5260

Product lineup to accommodate various applications

To accommodate various HPLC applications, the Chromaster product lineup includes autosamplers with loop injection and direct injection.
As both autosamplers have a pressure range of 60 MPa, they are applicable to high-resolution, high-speed analyses of UHPLC columns as well as traditional HPLC.

Item		5260	5280
Sample injection system		Loop injection method	Direct injection method
Withstand pressure		60 MPa	60 MPa
Washing function		Equipped with built-in washing pump Two-solvent washing function	Wash solvent delivery by a syringe
Sample rack temperature control (Temperature setting range)		1 to 45 ˚C Capable of cooling and heating	1 to 35 ˚C cooling only
Sample capacity	Standard	120 × 1,5 ml	200 × 1,5 ml
	Optional	72 × 4 ml	128 × 4 ml

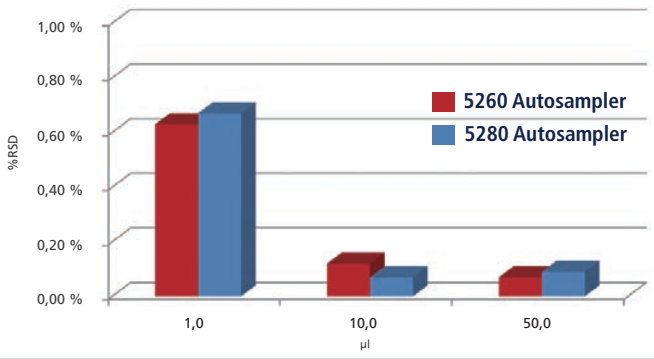
Excellent injection volume reproducibility supporting reliable analysis

The syringe and syringe moving part are optimized for each of the loop injection and direct injection systems. As a result, the measurement accuracy by the syringe is improved, resulting in excellent injection volume reproducibility.

Example: Injection volume reproducibility data

Conditions

Sample: 60 ppm Methylparaben
(Mobile phase: 60 % CH_3OH)
Flow rate: 1 ml/min
Wavelength: 265 nm
Injection method: (5260) Cut injection method



Low carry-over
≦0.003%
(under a specified condition)

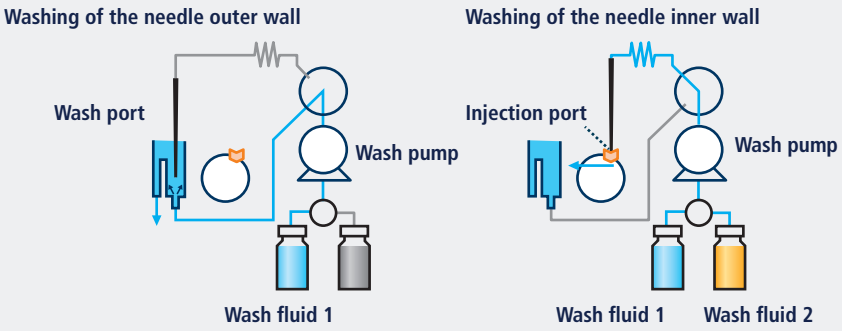
Extremely low carry-over

To reduce the amount of carry-over, an autosampler must be engineered to eliminate the dead volume in the flow path.
The Chromaster autosampler, thanks to the design of the tube connections and injection port shape, ensures extremely low carry-over for both the loop injection system and direct injection system.

5280

Loop injection autosampler for lower carry-over

5260 autosampler is equipped with a wash pump which provides highly efficient washing for the needle outer wall in order to achieve lower carry-over. As a result, the carry-over is as low as that from the direct injection system.
In addition, the standard installation includes a two-solvent washing function for the needle inner wall to ensure low carry-over even for the analysis of the most persistent components.

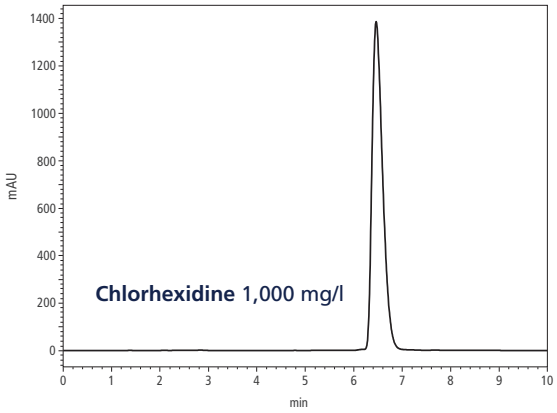


Additional settings to reduce carry-over

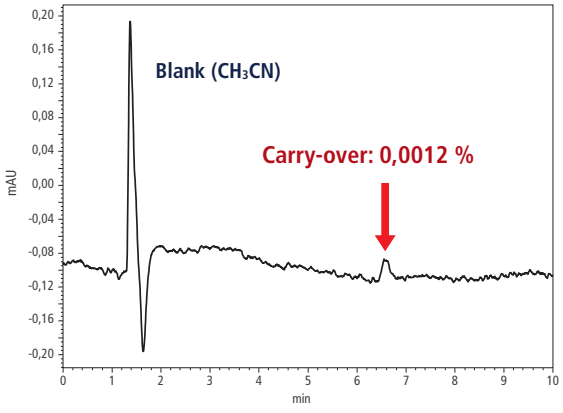
- Needle outer wall washing prior to sample drawing
- Two-solvent washing is available for the needle inner wall/inside the injection valve

Example: Carry-over analysis (5260)

Even when highly adsorbing Chlorhexidine is analyzed, the carry-over is extremely low.



Example of chlorhexidine analysis



Example of blank analysis after chlorhexidine analysis

Generous size column compartment width of 375 mm

5310 Column Oven

The photo is a column oven with a GUI controller (optional).

Easily accommodates a 300 mm analytical column fitted with a guard-column

The door, which opens in an L-shape pattern and with internal dimensions 375 mm wide and 114 mm high, facilitates the connection and stowing tasks for guard-column equipped column. The oven can accommodate up to three 300 mm columns.

Pre-heating function and wide temperature control range

The block-type pre-heating function based on Peltier heating and cooling control, delivers excellent peak symmetry and shape.*1
Also, the oven has the capability to regulate*2 temperature from 15 degree below ambient temperature to ambient temperature +60 °C, so it can accommodate various applications.

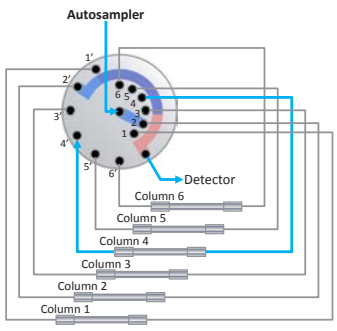
*1 Pre-heating pipings tailored to the flow rate used is available (optional).

*2 Temperature setting range: 1 to 85 °C

Pre-heating units

The photo represents a unit in which a part of the pre-heating cover is removed.

Column management system (5310 optional)



Hitachi column management system can manage the Log information on analytical columns and guard-columns from any manufacturer.
Log information can be written and read through a connector mounted on the column oven or USB port in the computer.
ID Tags can be used repeatedly.*3

*3 Approximate read/write life time: 100,000 times

Valve option for method development (6310 optional)

6-column selector valve for method evaluation is also available.

Improved operability over a wider temperature range

6310 Column Oven

Temperature range of 4 to 90 ˚C*4 and superior temperature stability

- Faster heating and cooling time
- Temperature control range: [ambient temperature -15] to [ambient temperature +75]˚C, and within the temperature setting range
- Temperature control precision: within ±0,1 ˚C (20 to 90 ˚C)
- Maximum column capacity of 6 x 100 mm columns or 300 mm x 3*5

*4: The range of temperature control depends on the ambient temperature.

*5: When MEM column fitting and optional valves are not used.

A view of column oven accommodating columns

Low volume pre-heating to suppress peak diffusion

The newly designed low volume pre-heating tube minimizes the peak diffusion while the temperature stability is maintained, resulting in high resolution analyses and high reproducibility.

	5310	6310
pre-heat piping volume	39 µl	1 µl

Built-in 3-liter Waste Tank

A 3-liter Waste Tank is housed below the column oven. Typically, a waste solution container is placed underfoot, but now the space for the container can be utilized for other purposes, and safety is also improved.

3-liter Waste Tank

MEM column fitting (6310 optional)

Hitachi's unique column fitting reduces the dead volume to a minimal level.

- A built-in spring presses the connection tube to the column inlet port, so the dead volume is kept extremely low.
- It can be secured by finger-tightening and the excellent pressure tolerance (Pressure resistance when used separately: 140 MPa) can be maintained even after repeated use.

MEM column fitting

5430 Diode Array Detector

Excellent qualitative analysis performance

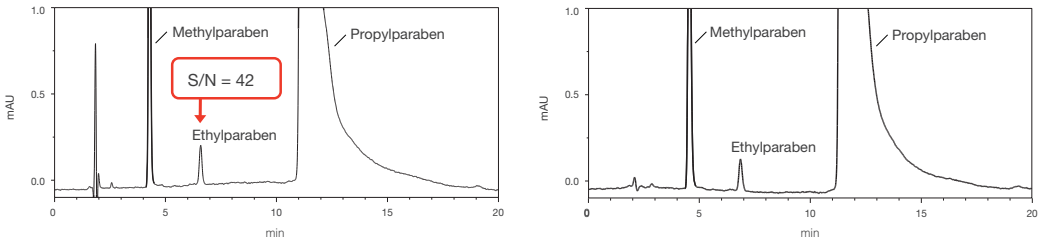
With a wide wavelength range of 190 nm to 900 nm, the 1,024-bit diode array in Chromaster Diode array detector delivers the world's best resolution.

Achievement of further low noise and low drift

The 5430 diode array detector is comparable to conventional Ultraviolet (UV) detectors for baseline noise to 0,5 × 10-5 AU[*1] (or less), and is capable of high-sensitivity detection.
The adoption of a variable air-volume fan and the provision of a specially designed cover on the spectrometer minimize of influence of temperature change around the optical system and achieves a further reduction in drift to 0,4 × 10-3 AU/hr[*1] (or less) and a reduction in lamp stabilization time by about 30% (In-house comparison).

*1 Under a specified condition

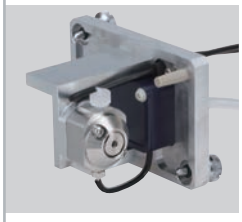
Comparison of Diode Array Detector and UV Detector



5430 Diode Array Detector **5410 UV Detector**

The noise and drift of 5430 diode array detector are as low as those of UV detectors, and high-sensitivity analyses are possible.

Common features (5410/5420/5430)



Thermostat flow cell (optional)

Thermostat controlled flow cell minimizes the influence of ambient temperature changes.
As a result, the baseline of detector is steady and data reliability improved.

Ultraviolet (UV) region wavelength check by means of a built-in Hg lamp

The emission lines of built-in D2 and Hg lamps allow wavelength checks over the ultraviolet to visible range. As there is no physical change with the Hg lamp over time, the accuracy check will result in highly reliable data.

Chromaster

Excellent qualitative and quantitative analysis performance

5430 Diode Array Detector
5410 UV/5420 UV-VIS Detector

5410 UV/5420 UV-VIS Detector

Low noise, low drift, and a high sensitivity detection

A noise level can achieve 0,5 × 10-5 AU*2 (or less) can be achieved, allowing better sensitivity than ever.
With a low drift of 1,0 × 10-4 AU / hr*3 (or less), these detectors deliver excellent baseline stability.

*2, 3 Under a specified condition

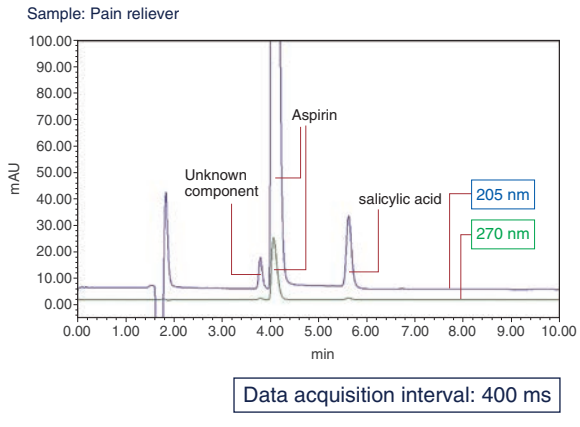
Two-wavelength simultaneous measurement function

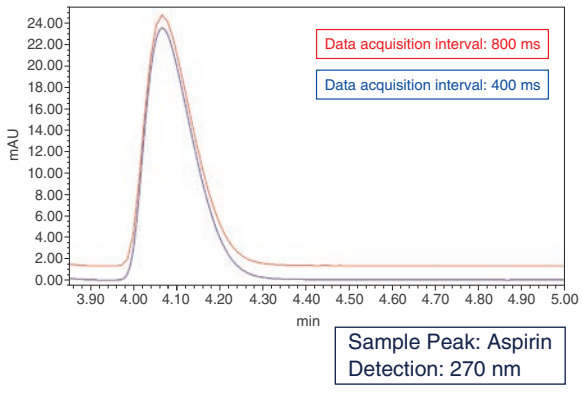
The two-wavelength detection function*4 permits measurements at short data acquisition intervals of 400 ms*5 and 800 ms per wavelength. The result is chromatograms with sharp peak shapes.

*4 Controlled by CDS only

*5 400 ms is available only if the wavelength interval is 160 nm or less.

Example: Two-wavelength simultaneous analysis data





The peak appears sharper by selecting a shorter data acquisition interval.

5440 Fluorescence Detector
5450 RI Detector

5440 Fluorescence Detector

High sensitivity with an S/N ratio of 900 or higher in water Raman

The detector incorporates low-light loss optics featuring a three-axis layout, Hitachi's proprietary condensing mirrors, a slit flow cell, and an optimized transmission light monitoring method. This is a high-sensitivity fluorescence detector with an S/N ratio of 900 or higher (based on the baseline method) in water Raman.

Thermostat flow cell (optional)

Thermostat controlled flow cell that minimize the influence of ambient temperature changes is available. You can use the flow cells when you need to perform measurements at a fixed, stable sensitivity.

Fluorescence detector with a variable slit

The spectrometer slit on the fluorescence side is variable between 15 nm and 30 nm. For high-sensitivity analyses, use the 30 nm slit.

Automatic wavelength check using a built-in Hg lamp

Similar to the UV detector, the 254 nm bright line from the Hg lamp can be used to perform wavelength checks in the UV region that is often used in HPLC analyses.

5450 Refractive Index (RI) Detector

Short stabilization time

The RI detector permits the start of measurement about 1 hour after it is powered on.

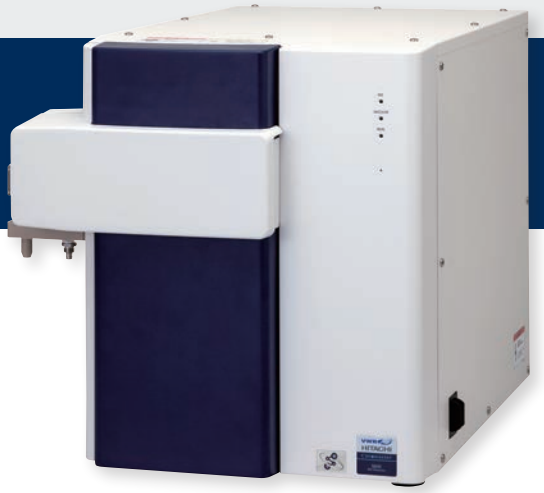
Flow cell with variable temperature setting

The cell temperature can be set from 30 to 50 °C (in 1 °C step). (when the room temperature is 20 °C).

Chromaster

Introducing a new mass detector from Hitachi designed for HPLC users

5610 MS Detector



Optimized for qualitative analysis

When measuring samples that do not absorb UV light or analyzing target compounds that cannot be identified by using UV spectra alone, additional information provided by mass spectra can improve the reliability of qualitative analysis.

Ease of use

Operability on par with standard HPLC systems. The atmospheric-pressure ion filter allows for replacement or cleaning of the filter without stopping the vacuum pump during maintenance.

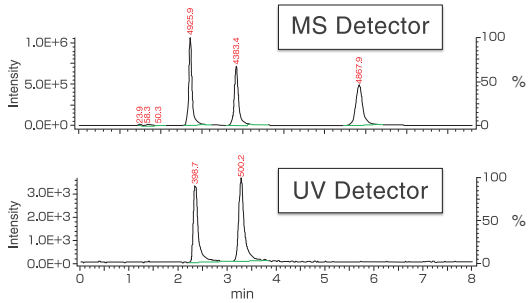
Atmospheric-pressure ion filter

Compact design for small footprint

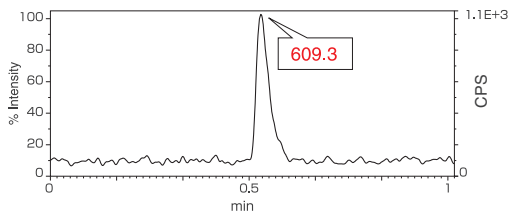
The space-saving footprint is equivalent to that of a standard HPLC system. The required power source is 200 to 240 VAC, allowing more flexibility when choosing the installation site. As the system is designed to use a minimum amount of N2 gas (maximum flow rate of 3,4 l/min), even an N2 gas cylinder can provide sufficient gas.

Application examples

■ Measurement of components that do not absorb UV light



■ Additional information *m/z* data

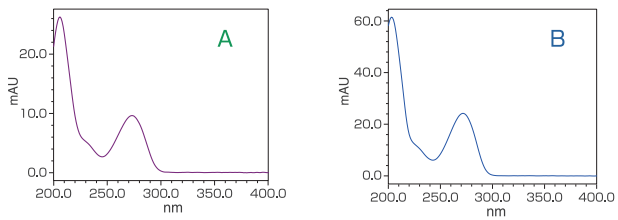


The *m/z* data can be displayed on the total ion chromatogram

*A software program for detector control and data analysis is supplied with 5610 MS Detector.

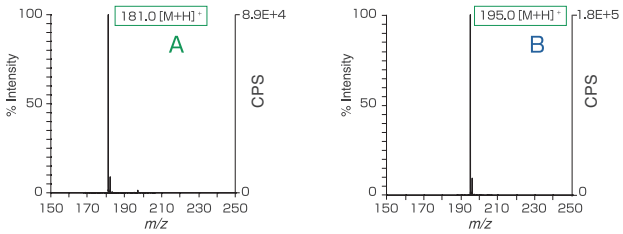
■ Improved data reliability

• UV spectrum



UV spectra alone cannot distinguish between A and B

• Mass spectrum



Additional mass spectra can help distinguish between A and B

Organizer

Organizer capable of accommodating various solvent bottles

The organizer can accept the simultaneous mounting of the following solvent bottles.

Organizer also doubles as a power supply module

The organizer, which is also a power supply module, supplies power to one pump, one autosampler, one detector (one UV detector, one UV-VIS detector, one Diode array detector or one RI detector), and one interface control board. Additional modules require an (optional) AC adapter or AC input.

Example	
1	3,785 l (U.S. gallon bottle) × 2 + 500 ml × 2
2	3 l (Japanese gallon bottle) × 2 + 500 ml × 2
3	2,5 l (EU gallon bottle) × 2 + 500 ml × 3
4	1 l bottle × 5 + 500 ml × 2

(1) to (3) are for isocratic, 2-liquid gradient analysis, designed for use in quality control operations.
(4) is for method development.

Intuitive operation via unique touch panel

GUI Controller

Integrated module control

- A color LCD monitor (5,7-inch color TFT display with LED back light) and a touch panel make for easy of viewing and simple operation.
- Modules[*1, *2] can be controlled from this controller.
- Supports single/sequence run analyses as directed from the autosampler.
- Up to 10 programs involving a timer function, pre-analysis system tasks (Wakeup), and post-analysis system tasks (Sleep) can be created[*1, *2, *3].
- The GUI controller can control three pumps (of which one is isocratic) (useful for building pre-treatment systems, such as deproteinization).
- The GUI controller enables you to check the status of consumables usage on units[*1, *2] that are connected to the system.

Main settings in the modules

Pump: Solvent feeding on/off, pump purging, and plunger washing
Autosampler: Needle washing, rinse-port washing, and syringe purging
Oven[*2]: Temperature control on/off, temperature settings, and valve switching
Detector: Lamp on/off, auto-zero, purging on/off (RI detector)

*1: Exclusive of 5610 MS detector *2: Exclusive of 6310 column oven *3: Exclusive of 5280 autosampler

Wakeup (automatic pre-analysis tasks) and Sleep (automatic post-analysis tasks) programs

Automatic system wakeup and sleep from GUI

- In conditioning, 10 programs for each pre-analysis system tasks (Wakeup) and post-analysis system tasks (Sleep) can be created in optional combination of settings.
- For Wakeup program ending time, you can specify any time up to three days later. The Sleep program starts at a specified time on the current day, the following day, or after the end of a continuous analysis run. The automation of system stand-by can reduce the amount of time required to make preparations for an analysis run.

Controller that pairs with one module – UI Pad (optional)

- The UI pad provides the flexibility of purchasing controllers for modules that require stand-alone operations.
- The large button size and a wide pitch enhance the ease of operation.
- Supports single/sequence run analyses by instructions received from the autosampler.

* Standard accessory for 5450 RI detector
* Not included with 5430 diode array detector, 5610 MS detector, and 6310 column oven

* Separate software for the instrument control and data processing is required when using 6310 column oven.

User oriented, convenient and smart system design

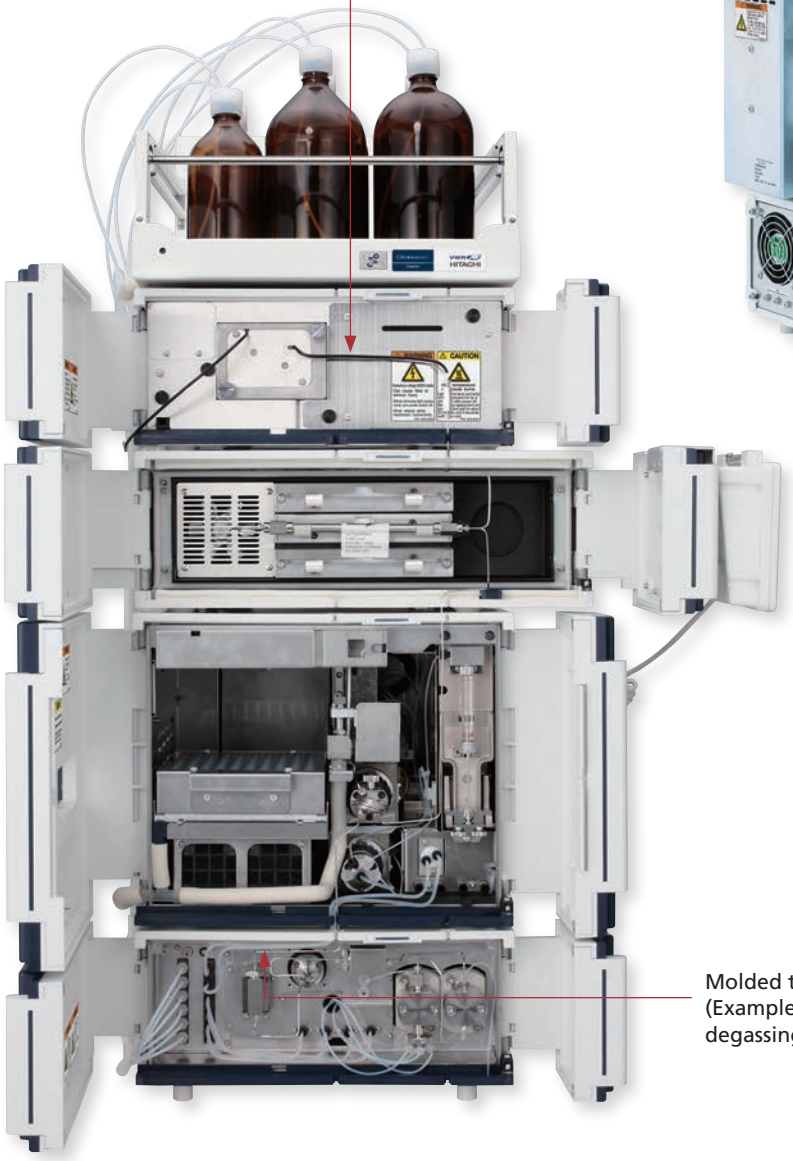
- Most optional accessories are internally mounted to reduce HPLC system height. The handle located on the front side of the organizer moves vertically for easy access to solvent bottles.
- With a module width of 340 mm[*1] and a depth of 440 mm, the system provides space savings.

  ⁎1 Exclusive of the column oven.
- Module operations and the replacement of consumable and maintenance parts can be performed from the front side.
- With attention to detail on the housing of tubes and wires, the system keeps tubes from getting tangled up, ensures the ease of replacement, and provides adequate seismic stability. In addition to incorporating these practical considerations, the system features a sleek, attractive appearance.

Front access
(Example: replacing lamps)

Wire covers
(Clamp between modules)

Tube holder for solvents
and waste fluids tubes



Stainless steel Inlet tube
(prevents tube deformation)

Molded tubes
(Example: tubes between the
degassing unit and the Autosampler)

Chromaster® Modules

5110/5160 Pump
5110/5160 Pump with Auto-purge valve

Main optional accessories		
Low-pressure Gradient Unit for 5110/5160 (with Conventional Mixer)	Manual Injector Holder	THF kit for 5110/5160*
6-channel Degassing unit (480 µl / ch)	Column Holder	THF kit for 5110/5160 with AP valve*
Plunger Washing Pump	UI Pad for 5110/5160	THF kit for Low Gr unit for 5110/5160
Conventional Mixer (700 µl)	AC adapter (150 W)	Low dispersion piping kit
Semi-micro Mixer (200 µl)	Hexane 6-channel Degassing unit for 5110/5160	
Dynamic Mixer (2,000 µl)	Hexane Check Valve Set for 5110	* Withstand pressure 40 MPa

5310/6310
Column Oven

Main optional accessories
Column management system for 5310
2-position, 6-port valve for 5310*
3 column selector valve for 5310*
UI Pad for 5310
MEM Column Fitting for 6310
6 column selector valve for 6310

* Withstand pressure 40 MPa

5610
MS Detector

Main optional accessories
System piping kit

Control and analysis software is standard accessory.

5410
UV Detector

Main optional accessories	
Analog signal output unit (1ch)	Semi-micro flow cell unit for 5410/5420
UI Pad for 5410/5420	HP SM flow cell unit for 5410/5420
AC adapter (150 W)	Preparative flow cell unit for 5410/5420
Thermo cell for 5410/5420	Thermo cell control unit for 5410/5420

5420
UV-VIS Detector

5430
Diode Array Detector

Main optional accessories
2ch Analog signal output unit for 5430
AC adapter (150 W)
Semi-micro flow cell unit for 5430
HP SM flow cell unit for 5430
Preparative flow cell unit for 5430
Thermo cell for 5430
Thermo cell control unit for 5430

Organizer

Main optional accessories
Can be used as a cabinet that holds solvent bottles
Supplies power to one pump, one autosampler, one detector (one UV detector, one UV-VIS detector, one Diode array detector or one RI detector), and one interface control board

5260/5280 Autosampler
5260/5280 Autosampler with Thermostat/Thermo Unit

5260 Main optional accessories		
Sample rack (4 ml × 72)	Thermostat micro plate rack (2 pcs)	AC adapter (150 W)
Thermostat rack (4 ml × 72)	Syringe kit (70 µl, 700 µl)	Hexane kit for 5210/5260
Sample rack (1 ml × 195)	Sample loop kit (5 µl, 10 µl, 20 µl)	THF kit for 5210/5260*
Thermostat rack (1 ml × 195)	2-channel Degassing unit (250 µl / ch)	
Micro plate rack (2 pcs)	UI Pad for 5260	

* Withstand pressure 40 MPa

5280 Main optional accessories		
Sample rack (4 ml × 128)	Thermo unit micro plate rack (3 pcs)	AC adapter (150 W)
Thermo unit rack (4 ml × 128)	Syringe kit (500 µl, 1 ml)	
Micro plate rack (3 pcs)	UI Pad for 5280	

5440
Fluorescence Detector

Main optional accessories
Analog signal output unit (1ch)
UI Pad for 5440
Thermo cell for 5440
Thermo cell control unit for 5440

5450
RI Detector

Main optional accessories
AC adapter (150 W)

Interface control board (IFC board)

Interface box

Front side

Back side

Main optional accessories
Interface control board (IFC board) (for installing a 5260 autosampler)
Interface box (S) (with an IFC board)
Interface box (L) (with IFC board and one AID board)

The Photo is an Interface box(L)with another AID board installed.
For systems that do not have an organizer, AC adapter (60 W) is required.

GUI Controller

Main optional accessories
GUI Controller – Interface Control Board is required.

AC adapter

Main optional accessories
AC adapter (60 W) (for IFC board/Interface box) For systems that do not have an organizer
AC adapter (150 W) (for Pump, Autosampler and UV/UV-VIS/Diode array detector/RI detector) For systems that do not have an organizer

Main specifications

5110/5160 Pump	5110	5160
Item	Specifications	
Pumping system	Dual plunger reciprocating pump system Series connection, pulsation elimination system	
Operating flow late range	0,001 to 9,999 ml/min	0,001 to 5,000 ml/min
Maximum operating pressure	40 MPa (0,001 to 5,000 ml/min) 20 MPa (5,001 to 9,999 ml/min)	60 MPa (0,001 to 2,500 ml/min) 30 MPa (2,501 to 5,000 ml/min)
Flow rate accuracy	±1,0 % or ±2,0 µl /min, whichever is greater (0,010 to 5,000 ml/min, under a specified condition)	±1,0 % or ±2,0 µl /min, whichever is greater (0,010 to 2,500 ml/min, under a specified condition)
Flow rate precision	SD0.02 min or RSD0.075 %, whichever is greater, under a specified condition	
Materials of wetted parts	Stainless steel, ruby, sapphire, ceramics, PTFE, carbon-containing PTFE, PEEK*1 (Auto-purge valve unit)	Stainless steel, ruby, sapphire, ceramics, PTFE, carbon-containing PTFE, Vespel*2 (Polyimide resin) (Auto-purge valve)
Functions of GLP	**(a)** Total flow rate display **(b)** Double speed error **(c)** Changeover number of times of the proportioning valve **(d)** Running time of the dynamic mixer **(e)** Changeover number of times of the auto purge valve **(f)** Operating time of the plunger wash pump	
Dimensions and weight	340 (W) × 440 (D) × 140 (H) mm, Approx.16 kg	
Power supply and Power consumption	DC 24 V, 4 A (Maximum) 96 W (power supply from organizer)	
Others	Pumps are available with and without an auto-purge valve.	

Low pressure gradient unit (Optional)	
Item	Specifications
Number of mixed solvents	Up to 4
Mixing system	Electromagnetic valve open/close time control system
Composition accuracy	±0,5 % (5 to 95 %)
Flow rate range recommended for analysis	0,4 to 1,8 ml/min

5260/5280 Autosampler	5260	5280
Item	Specifications	
Sample capacity	120 × 1,5 ml (Standard)	200 × 1,5 ml (Standard)
Sample injection system	Loop injection method (Cut injection, All volume injection, Full loop injection method)	Direct injection method
Syringe volume	175 µl (standard) (option syringe available)	100 µl (standard) (option syringe available)
Sample injection volume	0,1 to 50 µl (100 µl loop) (standard), 0,1 to 100 µl (200 µl loop) (accessory)	0,1 to 50 µl (standard)
Injection volume precision	≦0,2 %RSD (10 µl, cut injection method) ≦0,25 %RSD (5 µl, cut injection method) ≦0,9 %RSD (1 µl, cut injection method) ≦1,0 %RSD (1 µl, All volume injection method) ≦0,2 %RSD (5 µl, full loop method)	≦0,3 %RSD (10 µl, standard syringe)
Carry-over	≦0,003 % (cut method)	≦0,003 % RSD (under a specified condition)
Materials of wetted parts	Stainless steel, Vespel*2, fluororesin, PP, EPDM, PEEK*1, UHMWPE	Stainless steel, PEEK*1, fluororesin, PP, EPDM, Vespel*2, UHMWPE, DLC
Withstand pressure	60 MPa	60 MPa
Temperature setting range	1 to 45 °C (1 °C step), using Autosampler with a thermostat	1 to 35 °C (1 °C step), using Autosampler with a thermo unit
Temperature control range	[RT-21 °C] to [RT+25 °C] and range of the temperature setting (with a vial) [RT-15 °C] to [RT+20 °C] and range of the temperature setting (with a MTP) (using Autosampler with thermostat) An autosampler (with a thermostat) should be selected for the analysis of thermally sensitive samples.	4 to (RT - 5) °C at ambient temperature of 15 to 25 °C and humidity of 60 %
Functions of GLP	a)Injection port seal **(b)** Injection valve seal **(c)** Syringe valve seal **(d)** Syringe **(e)** Wash pump operation time	**(a)** Injection port seal **(b)** Injection valve seal **(c)** Syringe valve seal **(d)** Syringe
Dimensions and weight	340 (W) × 440 (D) × 280 (H) mm, approx. 24 kg (with thermostat, 340 (W) × 500 (D) × 280 (H)mm, approx. 29 kg)	340 (W) × 520 (D) × 320 (H) mm, approx. 23 kg (with thermo unit, approx. 26 kg)
Power supply and Power consumption	DC24 V, 4 A (maximum)/96 W (power supply from organizer) AC100 to 240 V (50 Hz/60 Hz) 110 VA (using Autosampler with thermostat)	DC24 V, 4 A AC100 to 240 V ±10 % (50 Hz/60 Hz) 110 VA (using Autosampler with thermo unit)
Others	Autosamplers are available with and without a thermostat.	Autosamplers are available with and without a thermo unit.

5310/6310 Columm Oven	5310	6310
Item	Specifications	
Temperature control system	Heating/Cooling block + air circulation system	
Temperature setting range	1 to 85 °C (1 °C step)	1 to 90 °C (1 °C step)
Temperature control range	[Ambient temperature –15 °C] to [Ambient temperature +60 °C] and range of the temperature setting	[Ambient temperature –15 °C] to [Ambient temperature +75 °C] and within temperature setting range
Temperature accuracy	± 1,0 °C (20 to 85 °C, part of Pre-heat)	± 0,5 °C (20 to 50 °C), ± 1,0 °C (51 to 90 °C), after calibration
Temperature control precision	SD≤–0,2 °C (under a specified condition)	± 0,1 °C (20 to 90 °C)
Time program functions	• Temperature setting • Switching valve (changing of position)	• Temperature setting • Switching valve (changing of position)
Functions of GLP	Recording of the changeover number of times and exchange dates of the optional changeover valve.	
Column capacity	300 mm × 3 (maximum)	
Dimensions and weight	410 (W) × 440 (D) × 140 (H) mm , Approx.13kg	165 (W) × 515 (D) × 689 (H) mm (Legs are not included), approx. 25 kg
Power supply and Power consumption	AC100 to 240 V (50 Hz/60 Hz)/230 VA (with optional valves) The Organizer and the AC adaptor are not necessary.	AC100 to 240 V (50 Hz/60 Hz)/300 VA The Organizer and the AC adaptor are not necessary.

5410 UV Detector	
Item	**Specifications**
Optical system	Double-beam ratio photometric system
Light source	D2 lamp, Hg lamp for checking wavelength
Wavelength range	190 nm to 600 nm
Wavelength accuracy	±1 nm
Spectral bandwidth	6 nm
Noise	≤–0,5 × 10–5 AU at 250 nm, under a specified condition
Drift	≤–1,0 × 10–4 AU/h at 250 nm, under a specified condition
2-wavelength measurement	2 wavelengths in wavelength regions 190 to 350 nm and 351 to 600 nm, respectively (Minimum wavelength interval 5 nm, max. wavelength interval 160 nm with data sampling period set at 400 ms)
Response	0,01 sec, 0,02 sec, 0,05 sec, 0,1 sec, 0,5 sec, 1 sec, 2 sec
Materials of wetted parts	Quartz glass, fluororesin, stainless steel
Functions of GLP	**(a)** D2 lamp/Hg lamp lighting time, lighting number of times, and replacement record **(b)** Key lock **(c)** D2 lamp energy check and D2 lamp wavelength check **(d)** Hg lamp wavelength check
Flow cell	13 µl (Optical path length 10 mm)
Thermostatically flow cell	Optional, environmental temperature range: 4 to 30 °C
Dimensions and weight	340 (W) × 440 (D) × 140 (H) mm, approx. 14 kg
Power supply and Power consumption	DC24 V, 2,5 A (maximum)/60 W (power supply from organizer) Please purchase the AC adaptor (150 W) when there is no organizer.

5430 Diode Array Detector	
Item	**Specifications**
Detection type	1,024 bit PDA
Light source	D2 lamp, W lamp, Hg lamp for checking wavelength
Wavelength range	190 to 900 nm
Wavelength accuracy	±1 nm
Noise	≤–0,5 × 10–5 AU at 250 nm, 600 nm, under a specified condition
Drift	≤–0,4 × 10–3 AU/h at 250 nm, 600 nm, under a specified condition
Response	0,01 sec, 0,02 sec, 0,05 sec, 0,1 sec, 0,5 sec, 1 sec, 2 sec
Slit type	1 nm/4 nm (variable)
Materials of wetted parts	Quartz glass, fluororesin, stainless steel
Functions of GLP	**(a)** D2 lamp/W lamp/Hg lamp lighting time, lighting number of times, and replacement record **(b)** D2 lamp energy check **(c)** W lamp energy check **(d)** Hg lamp wavelength check **(e)** D2 lamp wavelength check
Flow cell	13 µl (optical path length 10 mm)
Thermostat flow cell	Optional, environmental temperature range: 15 to 30 °C
Dimensions and weight	340 (W) × 440 (D) × 140 (H) mm, approx. 14 kg
Power supply and Power consumption	DC24 V, 3.5 A (maximum) /84 W (power supply from organizer) Please purchase the AC adaptor (150 W) when there is no organizer

5450 RI Detector	
Item	**Specifications**
Refractive index range	1 to 1,75
Noise	≤–2,5 × 10–9 RIU
Drift	≤–0,2 × 10–6 RIU/h
Time constant	0,05 sec, 0,1 sec, 0,25 sec, 0,5 sec, 1,sec, 1,5 sec, 2 sec, 3 sec, 6 sec
Temperature control range	OFF, and 30 to 50 °C
Materials of wetted parts	Stainless steel, fluororesin, quartz glass, sapphire (Al_2O_3)
Dimensions and weight	340 (W) × 440(D) × 140 (H) mm, excluding projections, approx. 13 kg
Power supply and Power consumption	DC24 V, 5 A (maximum)/120 W (maximum) (power supply from organizer) Please purchase the AC adaptor (150 W) when there is no organizer.

5610 MS Detector	
Item	**Specifications**
Measurement mass range (m/z)	20 to 1,000
Ion source	Electrospray ionization (ESI)
Dimensions and Weight	440(W) x 610(D) x 430(H) mm / approx. 51 kg
Power supply and Power consumption	AC 200 to 240 V (50 Hz/60 Hz)/1,000 VA
N2 gas usage	Max flow rate 3,4 l/min, pressure 300 ± 20 kPa

5420 UV-VIS Detector	
Item	**Specifications**
Optical system	Double-beam ratio photometric system
Light source	D2 lamp, W lamp, Hg lamp for checking wavelength
Wavelength range	190 nm to 900 nm
Wavelength accuracy	±1 nm
Spectral bandwidth	6 nm
Noise	≤–0,5 × 10–5 AU at 250 nm, 600 nm, under a specified condition
Drift	≤–1,0 × 10–4 AU/h at 250 nm, 600 nm, under a specified condition
2-wavelength measurement	2 wavelengths in wavelength regions 190 to 350 nm, 351 to 400 nm, 401 to 600 nm and 601 to 900 nm (D2&W mode) 2 wavelengths in wavelength regions 190 to 350 nm and 351 to 600 nm (D2 mode) 2 wavelengths in wavelength regions 380 to 600 nm and 601 to 900 nm (W mode) (Minimum wavelength interval 5 nm, max. wavelength interval 160 nm with data sampling period set at 400 ms)
Response	0,01 sec, 0,02 sec, 0,05 sec, 0,1 sec, 0,5 sec, 1 sec, 2 sec
Materials of wetted parts	Quartz glass, fluororesin, stainless steel
Functions of GLP	**(a)** D2 lamp/W lamp/Hg lamp lighting time, lighting number of times, and replacement record **(b)** Key lock **(c)** D2 lamp energy check and D2 lamp wavelength check **(d)** W lamp energy check **(e)** Hg lamp wavelength check
Flow cel	13 µl (optical path length 10 mm)
Thermostatically flow cell	Optional, environmental temperature range: 4 to 30 °C
Dimensions and weight	340 (W) × 440 (D) × 140 (H) mm, approx. 14 kg

5440 Fluorescence Detector	
Item	**Specifications**
Light source	Xe lamp, Hg lamp for checking wavelength
Wavelength range	Ex: 200 to 850 nm Em: 250 to 900 nm (change photomultiplier at 731 nm or more)
Wavelength accuracy	±3 nm
Response	0,01 sec, 0,02 sec, 0,05 sec, 0,1 sec, 0,5 sec, 1 sec, 2 sec
Spectral bandwidth	Ex: 15 nm, Em: 15, 30 nm (variable)
Sensitivity	>900 S/N ratio of water raman (bandwidth 30 nm, Ex=350 nm, TC=2 s, baseline method, standard cell)
Materials of wetted parts	Quartz glass, fluororesin, stainless steel
Functions of GLP	**(a)** lamp energy check, **(b)** wavelength accuracy check, **(c)** lamp lighting time, lighting number of times, and replacement record
Flow cell	Irradiation volume 12 µl
Thermostat flow cell	Optional, environmental temperature range: 4 to 30 °C
Dimensions and weight	340 (W) × 440 (D) × 280 (H) mm, approx. 25 kg
Power supply and Power consumption	AC100 to 240 V (50/60 Hz)/330 VA The Organizer and the AC adaptor are not necessary.

Organizer	
Item	**Specifications**
Output power	DC24 V, 450 W Supplies power to one pump, one autosampler, one detector (one UV detector, one UV-VIS detector, one diode array detector, or one RI detector), and one interface control board
Bottle capacity and the space	1,0 l bottle × 6 and 500 ml bottle × 3 (maximum), 314 (W) × 280,8 (D)mm
Dimensions and weight	340(W) × 420(D) × 200(H)mm, approx. 9 kg
Power supply and Power consumption	AC100 V to 240 V (50 Hz/60 Hz), 520 VA

*1 "PEEK" is a registered trademark of VICTREX PLC. in the European Union.

*2 Vespel: "VESPEL" is a registered trademark of E I Du Pont De Nemours and Company in Denmark and Switzerland.

HPLC system, Chromaster

All preconfigured systems (with or without detector) are delivered with all necessary cables and an interface board.

The VWR Hitachi Chromaster delivers highly reliable results. This is achieved with the high precision delivered by the pump, the low carry-over and high precision of the autosampler, the stability of the column oven and the sensitivity of the detectors.
VWR's relationship with Hitachi started over 30 years ago as a Merck Hitachi cooperation. During this time, the robustness and reliability of the Hitachi HPLC instruments has helped to build and develop a strong partnership.

Chromaster key parameters:

- 600 bar (60 MPa) maximum operating pressure as standard with highly stable pulsation elimination system
- Very low carry-over autosamplers. Loop injection and direct injection available with peltier thermostatted sample racks
- Highly sensitive fluorescence detector (optimised 30 nm slit)
- Diode Array Detector, 1028 bit PDA with very low drift and noise
- Excellent gradient reproducibility
- Automatic wavelength using mercury lamp for UV, DAD and Fluorescence Detectors
- Unique touch screen user interface
- Drivers available for OpenLab® CDS, Chromeleon® 6.8 and 7.X, Empower3® and Clarity

For further specifications and many more accessories, please download the brochure and product sheets.

Preconfigured systems		
High Resolution Chromaster systems with thermostat autosampler for small particle size columns (near UHPLC performance)	**pk**	**Cat. No.**
Chromaster HPLC system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler with peltier thermostated rack to 45 °C and low carry-over loop injection 175 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5410 UV detector with high pressure 150 bar semi micro (3,2 µl, 5 mm) flow cell kit for low dispersion. Chromaster System Manager control and data acquisition software included. Suitable for use with smaller particle size columns for faster HPLC	1	903-0350
Chromaster HPLC system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler with peltier thermostated rack to 45 °C and low carry-over loop injection 175 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5430 diode array detector with high pressure 150 bar semi micro (3,2 µl, 5 mm) flow cell kit for low dispersion. Chromaster System Manager control and data acquisition software included. Suitable for use with smaller particle size columns for faster HPLC	1	903-0336
Chromaster systems for use with standard columns	**pk**	**Cat. No.**
Chromaster HPLC system including 5160 quaternary gradient pump max. pressure 600 bar with manual purge valve and 6 channel degasser. 5260 autosampler with low carry-over loop injection and 175 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5410 variable wavelength UV detector with 13 µl, 10 mm flow cell. Chromaster System Manager control and data acquisition software included	1	903-0337
Chromaster HPLC system including 5160 quaternary gradient pump max. pressure 600 bar with auto purge valve and 6 channel degasser.5260 autosampler and low carry-over loop injection 175 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5420 variable wavelength UV detector with 13 µl, 10 mm flow cell	1	903-0354
Chromaster HPLC system including 5160 quaternary gradient pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler and low carry-over loop injection 175 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5410 variable wavelength UV detector with 13 µl, 10 mm flow cell. Chromaster System Manager control and data acquisition software included	1	903-0396
Chromaster systems with Direct Injection autosampler (UV or DAD)	**pk**	**Cat. No.**
Chromaster HPLC system including 5160 quaternary gradient pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5280 autosampler with 200 vial rack and direct injection with needle integrated into sample loop and 100 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5410 variable wavelength UV detector with 13 µl, 10 mm flow cell	1	903-0352
Chromaster HPLC system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5280 autosampler with 200 vial peltier cooled sample rack, direct injection with needle integrated into sample loop and 100 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5430 diode array detector with 13 µl, 10 mm cell	1	903-0353
Chromaster systems with Loop injection and DAD	**pk**	**Cat. No.**
Chromaster HPLC system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler with peltier thermostated rack to 45 °C and low carry-over loop injection 175 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5430 diode array detector with 13 µl, 10 mm cell. Chromaster System Manager control software included	1	903-0593
Chromaster HPLC system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler with peltier thermostated rack to 45 °C and low carry-over loop injection 175 µl syringe. 5310 oven for max. 3 x 300 mm columns. 5430 diode array detector with 13 µl, 10 mm cell	1	903-0355
Chromaster manual injection system	**pk**	**Cat. No.**
Chromaster HPLC manual injection system including 5160 quaternary gradient pump max. pressure 600 bar with manual purge valve and 6 channel degasser. 7725I-188 Manual Injection Valve, 5410 variable wavelength UV detector with 13 µl, 10 mm flow cell. Chromaster System Manager control and data acquisition software included	1	903-0363

Preconfigured systems without detector		
Preconfigured loop injection autosampler systems without detector	**pk**	**Cat. No.**
Chromaster HPLC base system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler with peltier thermostated rack to 45 °C and low carry-over loop injection. 5310 oven for max. 3 x 300 mm columns	1	903-0340
Chromaster HPLC base system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler with low carry-over loop injection and rack for 120 x 1,5 ml vials. 5310 oven for max. 3 x 300 mm columns	1	903-0341
Chromaster HPLC base system including 5160 quaternary pump max. pressure 600 bar with manual purge valve and 6 channel degasser. 5260 autosampler with peltier thermostated rack to 45 °C and low carry-over loop injection. 5310 oven for max. 3 x 300 mm columns	1	903-0342
Chromaster HPLC base system including 5160 quaternary pump max. pressure 600 bar with manual purge valve and 6 channel degasser. 5260 autosampler with low carry-over loop injection and rack for 120 x 1,5 ml vials. 5310 oven for max. 3 x 300 mm columns	1	903-0343
Preconfigured direct injection autosampler systems without detector	**pk**	**Cat. No.**
Chromaster HPLC base system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5280 autosampler, peltier cooling with 200 vial rack and direct injection with needle integrated into sample loop and 100 µl syringe. 5310 oven for max. 3 x 300 mm columns	1	903-0356
Chromaster HPLC base system including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5280 autosampler with 200 vial rack and direct injection with needle integrated into sample loop and 100 µL syringe. 5310 Oven for max. 3 x 300 mm columns	1	903-0357
Chromaster HPLC base system including 5160 quaternary pump max. pressure 600 bar with manual purge valve and 6 channel degasser. 5280 autosampler, peltier sample cooling with 200 vial rack and direct injection with needle integrated into sample loop and 100 µl syringe. 5310 oven for max. 3 x 300 mm columns	1	903-0358
Chromaster HPLC base system including 5160 quaternary pump max. pressure 600 bar with manual purge valve and 6 channel degasser. 5280 autosampler with 200 vial rack and direct injection with needle integrated into sample loop and 100 µl syringe. 5310 oven for max. 3 x 300 mm columns	1	903-0359
Preconfigured systems for other modes without detector.	**pk**	**Cat. No.**
Chromaster HPLC base system for gel permeation chromatography including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler with peltier thermostated rack to 45 °C and low carry-over loop injection. 5310 Oven for max. 3 x 300 mm columns. THF Resistant parts included	1	903-0338
Chromaster HPLC base system for normal phase chromatography including 5160 quaternary pump max. pressure 600 bar with auto purge valve and 6 channel degasser. 5260 autosampler with low carry-over loop injection. 5310 Oven for max. 3 x 300 mm columns with high temperature stability. Hexane/Heptane resistant parts included	1	903-0339

Main modules		
Description	**pk**	**Cat. No.**
Chromaster HPLC 5410 UV variable wavelength detector	1	903-0524
Chromaster HPLC 5420 UV-VIS variable wavelength detector	1	903-0525
Chromaster HPLC 5430 diode array detector without flow cell	1	903-0597
Chromaster HPLC 5440 fluorescence detector	1	903-0527
Chromaster HPLC 5440 standalone flourescence detector including UI pad, analogue output, detector signal cable and power unit	1	903-0360
Chromaster HPLC 5450 refractive index detector	1	903-0528
Chromaster 5610 mass selective detector, including control software (MSD System Manager, English Version)	1	903-0397
ELSD 90 HPLC low temperature evaporative light scattering detector, 230 V, EU-plug	1	903-0271
Chromaster HPLC 5110 pump with manual purge valve. 400 bar max. operating pressure (9,99 ml/min max. flow rate)	1	903-0500
Chromaster HPLC 5110 pump with auto-purge valve. 400 bar max. operating pressure (9,99 ml/min max. flow rate)	1	903-0501
Chromaster HPLC 5160 pump with manual purge valve. 600 bar max. operating pressure (4,99 ml/min max. flow rate)	1	903-0554
Chromaster HPLC 5160 pump with auto-purge valve. 600 bar max. operating pressure (4,99 ml/min max. flow rate)	1	903-0555
Chromaster HPLC 5260 autosampler with 175 µl syringe. 600 bar max. operating pressure	1	903-0556
Chromaster HPLC 5260 autosampler with thermostat and 175 µl syringe. 600 bar max. operating pressure	1	903-0557
Chromaster HPLC 5280 autosampler with peltier cooling unit and 100 µl syringe. 600 bar max. operating pressure	1	903-0345
Chromaster HPLC 5280 autosampler with 100 µl syringe. 600 bar max. operating pressure	1	903-0344
Chromaster HPLC 5310 column oven for max. 3 x 300 mm columns	1	903-0520
Chromaster HPLC 6310 column oven for max. 6 x 100 mm columns or max. 3 x 300mm columns	1	903-0361
Chromaster organiser for solvent placement and power supply	1	903-0537

Accessories		
Description	**pk**	**Cat. No.**
Chromaster HPLC low pressure quaternary gradient unit. Includes proportioning valves, conventional mixer and capillaries. For Chromaster HPLC 5110 and 5160 pumps	1	903-0562
Chromaster HPLC 6-channel degassing unit with 480 µl degassing chambers. For Chromaster HPLC 5110 and 5160 pumps	1	903-0503
Chromaster HPLC built-in dedicated mini pump for washing the plunger of the Chromaster HPLC 5110 and 5160 pumps	1	903-0563
Chromaster HPLC 6-channel hexane resistant degassing unit with 480 µl degassing chambers for use with both Chromaster HPLC 5110 and 5160 pumps	1	903-0567
Chromaster HPLC hexane resistant check valve for Chromaster HPLC 5110 and 5160 pumps	1	903-0559

HPLC control interfaces for Chromaster		
Description	**pk**	**Cat. No.**
Chromaster system manager software for method creation, data acquisition, chromatograph data processing, DAD data processing and report generation	1	906-0144
OpenLAB CDS EZChrom Edition including 1 year Software Maintenance Agreement + Hitachi LC Control	1	906-0145
OpenLAB CDS EZChrom Edition including 1 year Software Maintenance Agreement + Hitachi LC Control + Hitachi DAD	1	906-0146
Chromaster HPLC Interface Control Board for Chromaster system control. USB cable and e-line cable (0,5 m) included. Built into the autosampler upon installation in laboratory. If no autosampler is used, then the interface box (S) must be ordered instead	1	903-0545
Chromaster HPLC graphical user interface (GUI) touch screen controller for Chromaster 5000 series for integrated module control	1	903-0546

PC for software installation		
Description	**pk**	**Cat. No.**
Dell™ PC 64Bit/8Gb with Intel™ i5 Quad Core Chipset. Includes Dell™ mouse and international keyboard. 12 MUI languages preloaded. Three years Dell™ Warranty Next Business Day On Site plus two year LabService guarantee. Dell™ monitor 20" wide is included"	1	906-0210

Fraction collector (New)		
Description	**pk**	**Cat. No.**
Foxy R1, stand-alone package, includes diverter valve and rack for 18 mm Ø ext. tubes, interface and remote cable, E-DIO cable, flow rates up to 25 ml/min (with 1/16" outlet tubes)	1	905-0533

Control licences for Chromaster with existing software set-up		
Description	**pk**	**Cat. No.**
Chromaster Driver control licence for Waters Empower3®	1	906-0156
Chromaster control licence for Chromeleon® 6.8	1	906-0185
Chromaster control licence for Chromeleon® 7.X	1	906-0186
OpenLab™ CDS EZChrom edition licence for additional Hitachi HPLC with Diode Array on the same PC	1	906-0148
OpenLab™ CDS EZChrom edition licence for additional Hitachi HPLC on the same PC	1	906-0147

Accessories			
Description	**For**	**pk**	**Cat. No.**
Chromaster HPLC user interface keypad. Mounting parts included	Chromaster HPLC 5110 and 5160 pumps	1	903-0540
Chromaster HPLC user interface keypad. Mounting parts included	Chromaster HPLC 5260 autosamplers (built into the autosampler upon installation in laboratory)	1	903-0541
Chromaster HPLC user interface keypad. Mounting parts included	Chromaster HPLC 5310 column ovens (built into the column oven upon installation in laboratory)	1	903-0542
Chromaster HPLC user interface keypad. Mounting parts included	Chromaster HPLC 5410 UV detectors and 5420 UV-VIS detectors (built into the detector upon installation in laboratory)	1	903-0543
Chromaster HPLC user interface keypad. Mounting parts included	Chromaster HPLC 5440 fluorescence detectors (built into the detector upon installation in laboratory)	1	903-0544
Pump accessories	**For**	**pk**	**Cat. No.**
Chromaster HPLC dynamic mixer 2000 µl	Chromaster HPLC 5110 and 5160 pumps (built into the pump upon installation in laboratory)	1	903-0564
Chromaster HPLC 200 µl semi-micro mixer for flow rates of 0,4 ml/min or less	Chromaster HPLC 5110 and 5160 pumps (built into the pump upon installation in laboratory)	1	903-0507
Chromaster HPLC 700 µl static mixer for conventional use with flow rates between 0,4 and 1,8 ml/min	Chromaster HPLC 5110 and 5160 pumps (built into the pump upon installation in laboratory)	1	903-0565
Chromaster HPLC adaption kit for THF (max pressure 400 bar)	Chromaster HPLC 5110 and 5160 pumps with manual purge valve (built into the pump upon installation in laboratory)	1	903-0568
Chromaster HPLC adaption kit for THF (max pressure 400 bar)	Chromaster HPLC 5110 and 5160 pumps with autopurge valve (built into the pump upon installation in laboratory)	1	903-0569
Chromaster HPLC THF resistant Vespel® packing	Chromaster conventional mixer for use up to 400 bar	1	903-0570
Chromaster HPLC manual injection set	Chromaster configuration without autosampler	1	903-0362
Autosampler accessories	**For**	**pk**	**Cat. No.**
Chromaster HPLC sample rack for 120 × 1,5 ml sample vials. Supplied as standard with the 5260 autosamplers	Chromaster HPLC 5260 autosamplers	1	903-0511
Chromaster HPLC sample rack for 72 × 4 ml sample vials	Chromaster HPLC 5260 autosamplers	1	903-0512
Chromaster HPLC sample rack for 195 × 1 ml sample vials. Rack for ambient use	Chromaster HPLC 5260 autosamplers	1	903-0513
Chromaster HPLC sample rack for 2 × 96-well or 384-well micro titre plates	Chromaster HPLC 5260 autosamplers	1	903-0514
Chromaster HPLC sample rack for 120 × 1,5 ml sample vials. Supplied as standard with the the 5260 thermostat autosamplers	Chromaster HPLC 5260 autosamplers	1	903-0406
Chromaster HPLC sample rack for 72 × 4 ml sample vials	Chromaster HPLC 5260 autosamplers with thermostat	1	903-0516
Chromaster HPLC sample rack for 195 × 1 ml sample vials	Chromaster HPLC 5260 autosamplers with thermostat	1	903-0517
Chromaster HPLC sample rack for 2 × 96-well or 384-well microtitre plates	Chromaster HPLC 5260 autosamplers with thermostat	1	903-0518
Chromaster HPLC 70 µl syringe kit	Chromaster HPLC 5260 autosamplers	1	560-0173
Chromaster HPLC 700 µl syringe kit	Chromaster HPLC 5260 autosamplers	1	903-0560
Chromaster HPLC 3000 µl syringe kit	Chromaster HPLC 5260 autosamplers	1	903-0596
Chromaster HPLC sample loop kit (5 µl)	Chromaster HPLC 5260 autosamplers	1	903-0573
Chromaster HPLC sample loop kit (10 µl)	Chromaster HPLC 5260 autosamplers	1	903-0574
Chromaster HPLC sample loop kit (20 µl)	Chromaster HPLC 5260 autosamplers	1	903-0575
Chromaster HPLC sample loop kit (100 µl)	Chromaster HPLC 5260 autosamplers	1	903-0576
Chromaster HPLC sample loop (200 µl)	Chromaster HPLC 5260 autosamplers	1	903-0577
Chromaster HPLC sample loop (1000 µl)	Chromaster HPLC 5260 autosamplers	1	903-0561
Chromaster HPLC sample loop (4000 µl)	Chromaster HPLC 5260 autosamplers	1	903-0578
Chromaster HPLC 2-channel degassing unit. Only needed if pump degasser is not used	Chromaster HPLC 5260 autosamplers (built into the autosampler upon installation in laboratory)	1	903-0519
Chromaster HPLC hexane resistant autosampler washing pump	Chromaster HPLC 5260 autosamplers	1	903-0571
Chromaster HPLC THF resistant autosampler kit	Chromaster HPLC 5210 autosamplers (built into the autosampler upon installation in the laboratory)	1	903-0572

Accessories			
Column oven accessories	**For**	**pk**	**Cat. No.**
Chromaster HPLC 3-column selection valve. Pressure stability to 345 bar. For 1/16" capillaries. Power unit, control board and tubes are included. One valve per oven only	Chromaster HPLC 5310 column ovens (built into the column oven upon installation in laboratory)	1	903-0521
Chromaster HPLC 2-position, 6-port valve. Power unit, control board and tubes are included	Chromaster HPLC 5310 column oven (built into the column oven upon installation in laboratory)	1	903-0522
Chromaster HPLC 6 column selector Rheodyne® valve	for Chromaster HPLC 6310 oven	1	903-0351
Chromaster HPLC column management system. Three column electronic data tags are included	Chromaster HPLC 5310 column oven (built into the column oven upon installation in laboratory)	1	903-0523
Chromaster HPLC column holder	Chromaster HPLC use when an oven is not ordered (built into the detector upon installation in laboratory)	1	903-0566
Detector accessories	**For**	**pk**	**Cat. No.**
Chromaster HPLC thermo cell. Flow cell control unit for 5410 UV detector and 5420 UV-VIS detector is also required	Chromaster HPLC 5410 UV detectors and 5420 UV-VIS detectors (built into the detector upon installation in laboratory)	1	903-0529
Chromaster HPLC thermostat cell control unit. Necessary for thermo cell for 5410 UV detectors and 5420 UV-VIS detectors	Chromaster HPLC 5410 UV detectors and 5420 UV-VIS detectors (built into the detector upon installation in laboratory)	1	903-0535
Chromaster HPLC high pressure semi-micro flow cell, 150 bar, 3,2 µl, 5 mm	Chromaster HPLC 5410 UV detectors and 5420 UV-VIS detectors	1	903-0581
Chromaster HPLC preparative flow cell, path length 0.5mm volume 9.8µL, pressure resistance 1MPa	Chromaster HPLC 5410 UV detectors and 5420 UV-VIS detectors	1	903-0583
Chromaster HPLC standard flow cell	Chromaster HPLC 5430 diode array detectors (built into the detector upon installation in laboratory)	1	903-0320
Chromaster HPLC thermo cell. The thermostat cell control unit for 5430 diode array detector is also required	Chromaster HPLC 5430 diode array detectors (built into the detector upon installation in laboratory)	1	903-0530
Chromaster HPLC thermostat cell control unit. Necessary for thermo cell for 5430 diode array detector	Chromaster HPLC 5410 UV detectors and 5420 UV-VIS detectors (built into the detector upon installation in laboratory)	1	903-0536
Chromaster HPLC high pressure semi-micro flow cell, 150 bar, 3,2 µl, 5 mm	Chromaster HPLC 5430 diode array detectors	1	903-0584
Chromaster HPLC preparative flow cell, path length 0.5mm volume 9.8µL, pressure resistance 1MPa	Chromaster HPLC 5430 diode array detectors	1	903-0586
Chromaster HPLC thermostat flow cell. Thermostat flow cell control unit for 5440 fluorescence detectors is also required	Chromaster HPLC 5440 fluorescence detectors (built into the detector upon installation in laboratory)	1	903-0532
Chromaster HPLC thermostat flow cell control unit. For use with thermostat flow cell for 5440 fluorescence detectors	Chromaster HPLC 5440 fluorescence detectors (built into the detector upon installation in laboratory)	1	903-0533
Chromaster HPLC interface box (L) with Interface Control Board (IFCB), USB-analogue input device (AID). AC adapter (60 W) is required	Chromaster HPLC systems without autosampler	1	903-0547
Chromaster HPLC interface box (S). AC adapter (60 W) is required	Chromaster HPLC systems without autosampler	1	903-0548
Chromaster HPLC USB-analogue input device. Maximum 2 USB-AID allowed per system. Interface Control Board is required	Chromaster HPLC with 1 channel for analogue signal acquisition for Chromatography Data System	1	903-0549
Chromaster HPLC 2-channel analogue signal output unit	Chromaster HPLC 5430 diode array detectors (built into the detector upon installation in laboratory)	1	903-0531
Chromaster HPLC 1-channel analogue signal output unit	Chromaster HPLC 5410 UV detectors, 5420 UV-VIS detectors and 5440 fluorescence detectors (built into the detector upon installation in laboratory)	1	903-0534
Additional accessories	**For**	**pk**	**Cat. No.**
Chromaster HPLC adapation plate	Chromaster HPLC assembling a LaChrom Elite® or LaChromUltra™ module into the configuration	1	903-0588
Chromaster HPLC tubing kit. Includes tubing and cables	Chromaster HPLC system in a two tower configuration	1	903-0587
Chromaster HPLC AC adapter (150 W)	Chromaster HPLC 5110/5160 pumps, 5260 autosamplers, 5410 UV detectors, 5420 UV-VIS detectors, 5430 diode array detectors and 5450 refractive index detectors. When no organiser is used	1	903-0538
Chromaster HPLC AC adapter (60 W)	Chromaster HPLC interface boxes (S) and (L)	1	903-0539

Low Dispertion Kits for <3 µm columns	For	pk	Cat. No.
Chromaster HPLC semi-micro flow cell kit including capillary set for low dispersion	Chromaster HPLC 5410 UV detectors and 5420 UV-VIS detectors	1	903-0589
Chromaster HPLC semi-micro flow cell kit including capillary set for low dispersion	Chromaster HPLC 5430 diode array detectors	1	903-0590

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