

# ION CHROMATOGRAPHY SYSTEM S 150

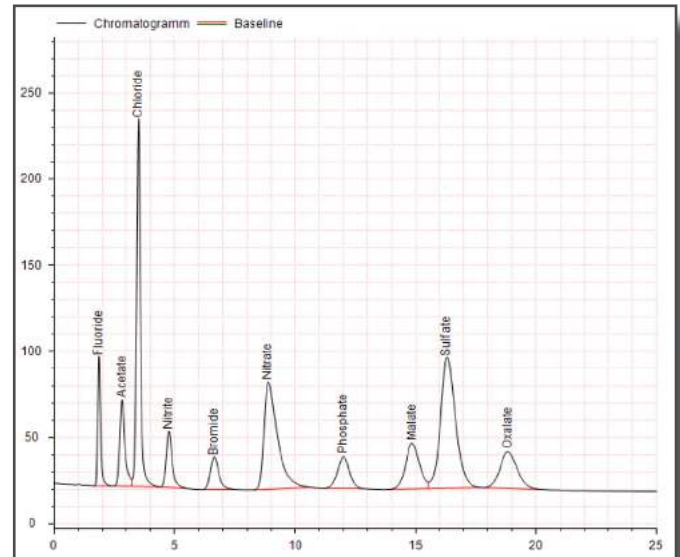
- ◆ ANION & CATION ANALYSIS
- ◆ WATER ANALYSIS
- ◆ ENVIRONMENTAL ANALYSIS



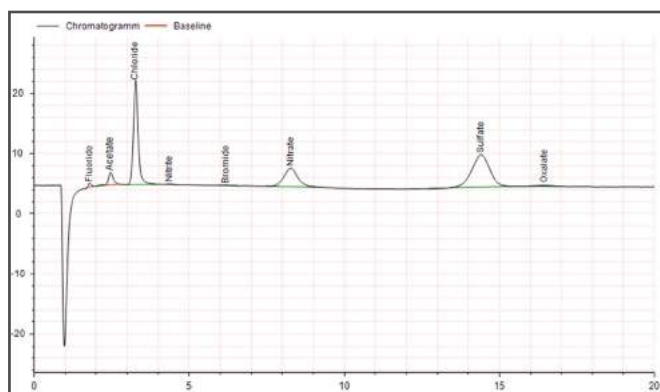
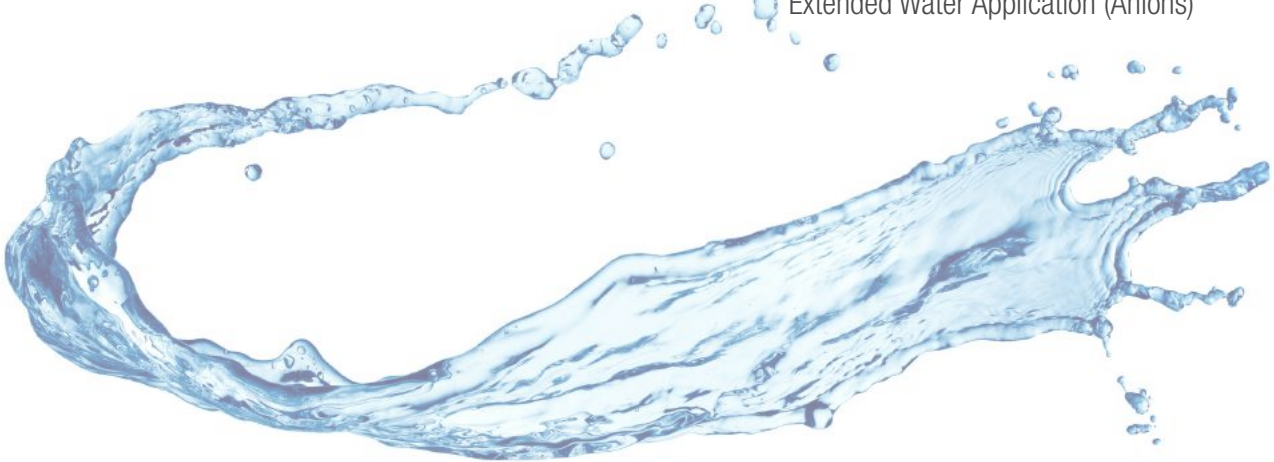
# ION CHROMATOGRAPHY

Ion Chromatography is an analytical separation technique based on ionic interactions. Dissolved in a mobile phase, analyte ions (e.g. Chloride, Nitrate) compete with eluent ions (e.g.  $\text{CO}_3^{2-}$ / $\text{HCO}_3^-$ ) to be adsorbed on the charged surface of the stationary phase.

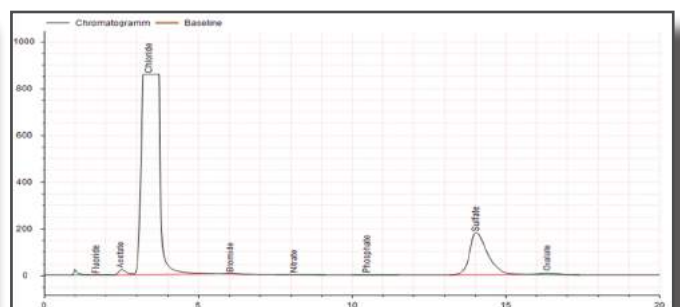
Depending on the analytes electrical charge this technique is classified in cation and anion exchange.



Extended Water Application (Anions)



Rain Water (Anions)



Sea Water (Anions)

## IC Applications

The field of application for Ion Chromatography is versatile. This technique found its way into routine and research applications:

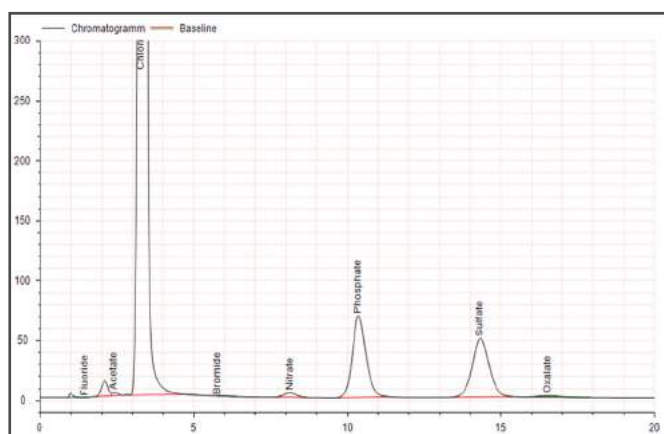
- Parameters
  - Anions
  - Cations
  - Organic acids
  - Transition metals
  - Amines
- Typical Applications
  - Drinking water
  - Tap water
  - Sea water
  - Waste water
  - Rain water
  - Ultra-trace determination in electronic and power plants
  - Quality control and analysis of impurities
  - Elemental analysis (Wickbold & Schoeninger)
  - Pharmaceuticals
  - Urine analysis



Water analysis for water treatment plants



Cooling water control for power plants



Urine (Anions)



Ground water analysis for quality control



# ION CHROMATOGRAPHY SYSTEM S 150

## Automatic IC System S 151 A

The **Automatic Ion Chromatograph S 151 A** is a modular system which can be customized to any application needs.

### S 1130 Pump System

The **Sykam S 1130 HPLC Pump System** is a very flexible and powerful HPLC solvent delivery system.

The possible configurations include an Isocratic or Quaternary Gradient Pump.

### S 5300 Sample Injector

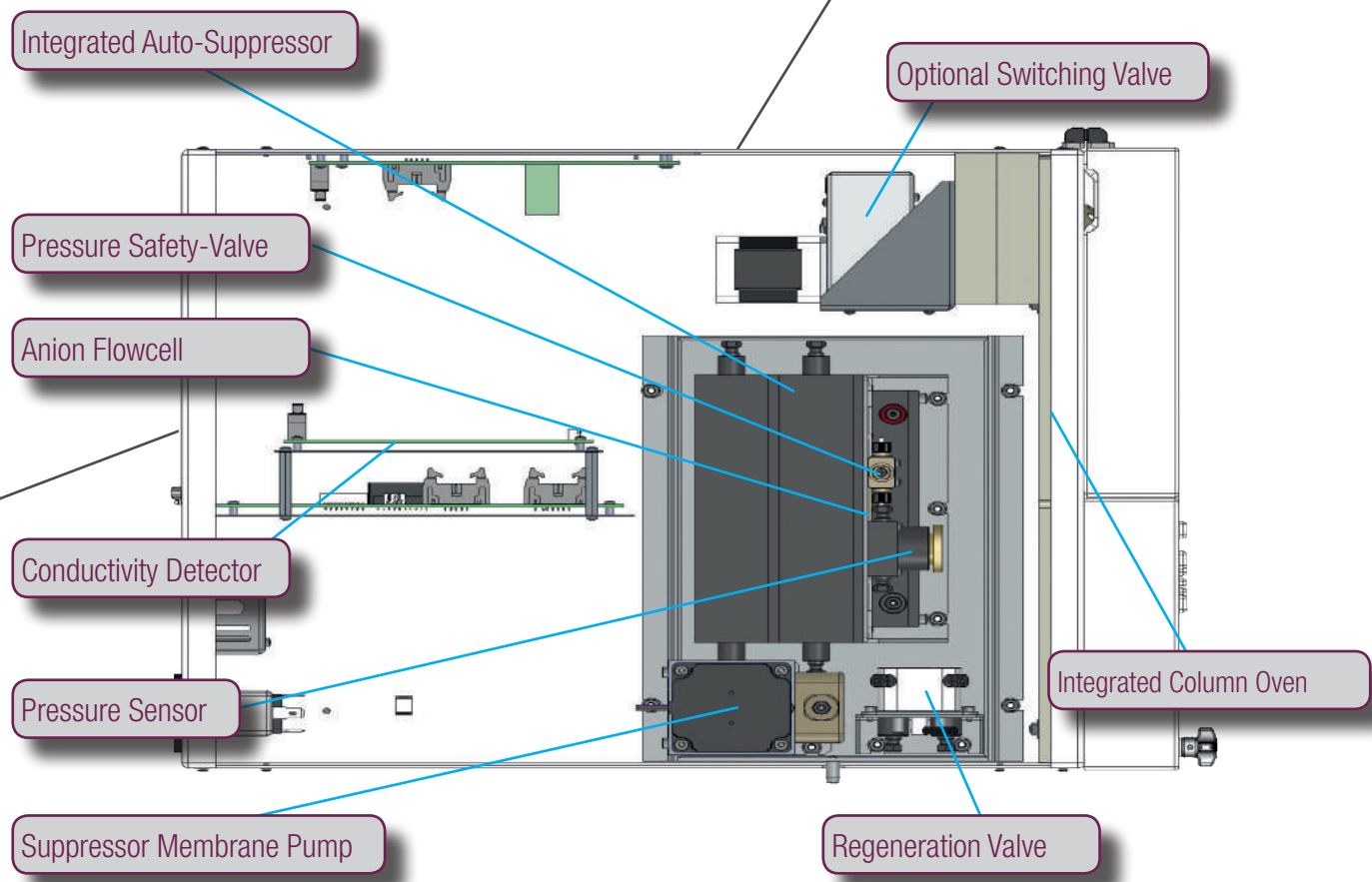
The **Sykam S 5300 Sample Injector System** is a reliable and accurate HPLC autosampler with excellent reproducibility and linearity properties. Variable vial racks and adaptors for microtiter plates as well as a multitude of options make this system highly adaptable and suitable for any analytical application.



## Manual IC System S 151 M

The **Manual Ion Chromatograph S 151 M** is a low-cost modular system for low sample throughput.

It can be upgraded to an automatic system at any time.



# SYKAM AUTO-SUPPRESSOR

The **Sykam Auto-Suppressor** is a robust chemical suppression system to increase the sensitivity of the anion analysis by reducing the background conductivity of the eluent.

## Trouble-Free Operation

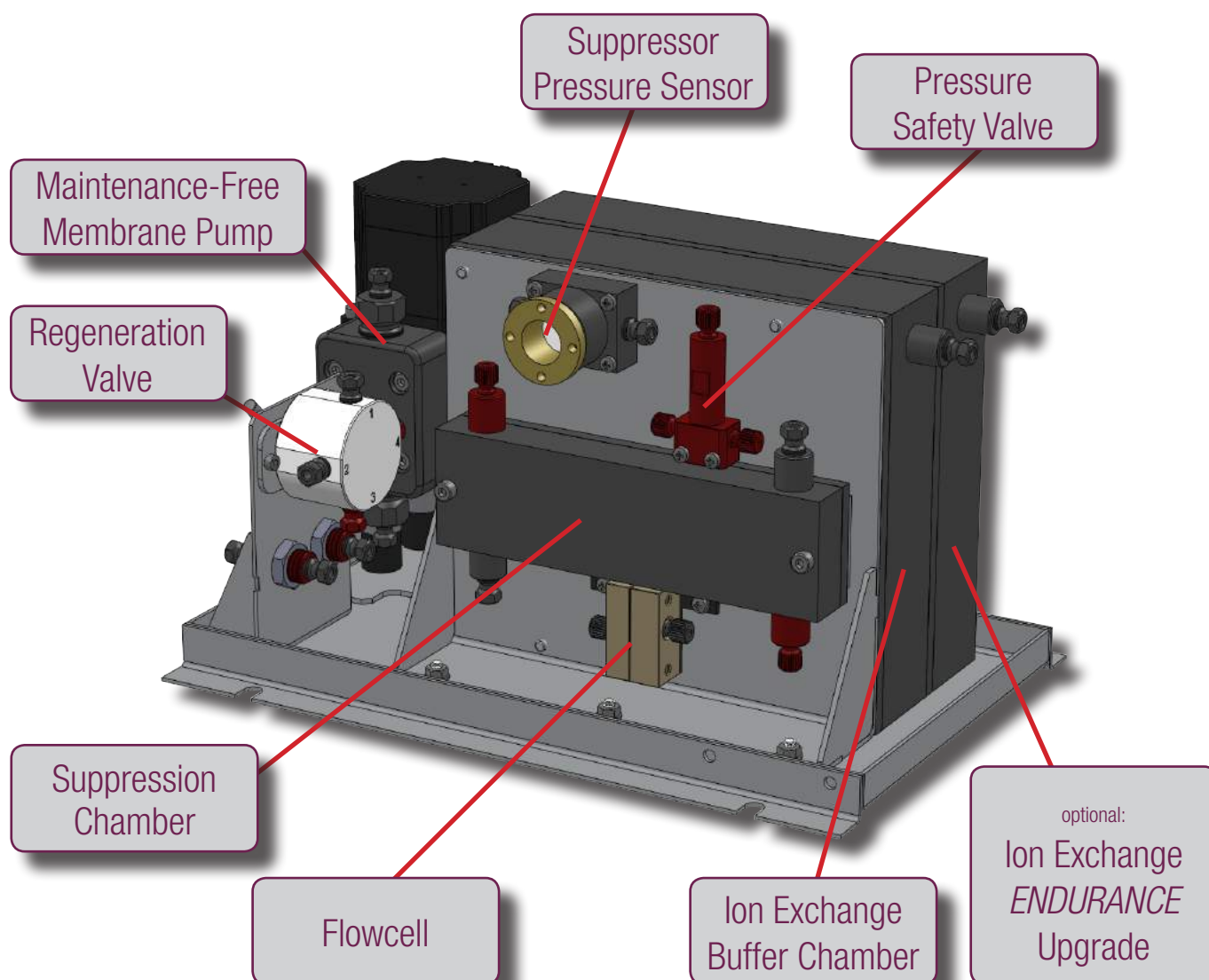
The **Sykam Auto-Suppressor's** membrane is protected by a **Pressure Safety Valve**, which opens when the pressure of the eluent flow is becoming too high. No annoying and expensive exchange of the membrane is needed!

The membrane pump is maintenance free in its

operation and the proper function is monitored by a built-in pressure sensor.

The closed suppression circuit provides continuous operation over a long time without the need of regeneration solutions. The capacity of the **Ion Exchange Buffer Chamber** can be increased with an **ENDURANCE** upgrade.

When the chamber's capacity is reached it can be easily regenerated without effort and need not to be replaced.



## Working Principle

Conductivity detection of anions in Ion Chromatography requires reduction of background conductivity to increase the detection sensitivity.

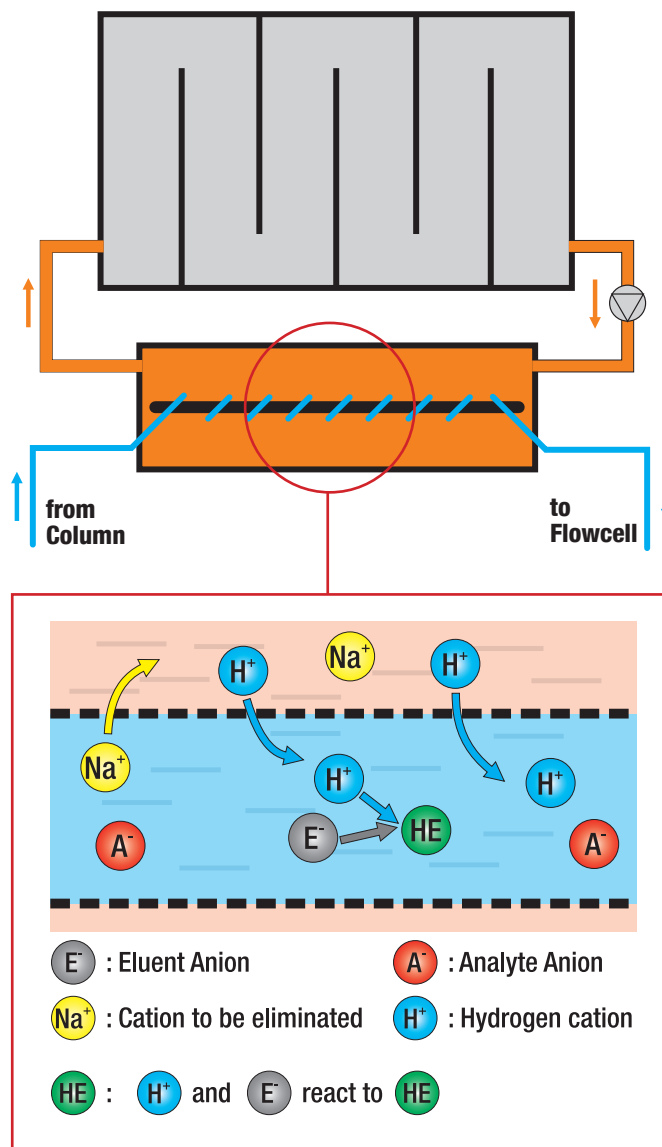
The eluent buffer (e.g.  $\text{Na}_2\text{CO}_3$  /  $\text{NaHCO}_3$ ) used to perform anion chromatography disturbs the Analyte measurement (e.g. Chloride, Nitrate, Sulfate).

The *Sykam Auto-Suppressor* substitutes counter cations of the eluent (e.g.  $\text{Na}^+$ ) with hydrogen ions. This transfers the eluent anion (e.g.  $\text{CO}_3^{2-}$ ) in a low conductive form and reduces the background conductivity.

The Analyte anions will not be interfered by this process. Their hydrogen forms (e.g. hydrochloric acid) are still dissociated.

The *Sykam Auto-Suppressor* combines:

- an ion exchange buffer chamber, filled with a durable and customer regenerative cation exchanger
- a transfer solution to transport hydrogen cations to the mobile phase and buffer cations to the resin
- and a membrane capillary that allows the transfer of hydrogen- and eluent cations



# TECHNICAL SPECIFICATIONS

## S 150 Ion Chromatography Module

<b>Wetted Materials:</b>	PEEK, PPS, PTFE, Stainless Steel <sup>1</sup>
<b>Dimensions:</b> (W x H x D)	396 x 165 x 478 mm
<b>Power Supply:</b>	100 - 250 ~V (47 - 63 Hz)

<sup>1</sup> Flowcell only

### Column Oven

<b>Temperature Range:</b>	+30°C to +100°C <sup>1</sup>
<b>Temperature Accuracy:</b>	< 0.1 °C
<b>Switching Valve:</b>	<i>optional:</i> any <b>S 6000</b> Series Valve

<sup>1</sup> Temperature range at 20°C ambient

### Conductivity Detector

<b>Measuring Range:</b>	20 nS/cm up to 20,000 µS/cm
<b>Flowcell Volume:</b>	0.76 µl

### Auto-Suppressor

<b>Pump System:</b>	Membrane Pump
<b>Safety Systems:</b>	- Pressure Sensor - Pressure Valve

## S 1130 Pump System

<b>Wetted Materials:</b>	PEEK, Teflon AF®, PVDF, Ceramics, Sapphire
<b>Flow Rate:</b>	Programmable Analytical: 0.001 - 10.000 ml/min
<b>Flow Accuracy:</b>	± 1.0 % 1.000 ml / min
<b>Flow Precision:</b>	± 0.1 % RSD 1.000 ml/min
<b>Pressure Range:</b>	0 – 40 MPa (0 – 6000 PSI)
<b>Pressure Pulsation:</b>	typical < 0.1 MPa or < 1.0 %
<b>Compressibility Compensation:</b>	user-adjustable for different solvents
<b>Vacuum Degassing:</b>	<i>optional:</i> < 20% dissolved gases remaining in water @ 1.000 ml/min
<b>Dimensions:</b> (W x H x D)	396 x 165 x 478 mm
<b>Power Supply:</b>	100 - 250 ~V (47 - 63 Hz)

## S 5300 Sample Injector System

<b>Wetted Materials:</b>	PEEK, PPS, PVDF
<b>Sample Capacity:</b>	120 (1.5 ml), 192 (microtiter plates)
<b>Injection Volume:</b>	Programmable 0.1 - 999.9 µl
<b>Sample Heating/Cooling:</b>	<i>optional:</i> +4 to +60 °C
<b>Injection Precision:</b>	< 0.5 % Variable Volume Injection (10 µl; typically ~0.25 %)
<b>Linearity:</b>	Correlation Factor > 0.999 (10 µl injection volume, 500 µl Syringe)
<b>Carry Over:</b>	< 0.05 % with wash program
<b>Dimensions:</b> (W x H x D)	396 x 275 x 478 mm
<b>Power Supply:</b>	100 - 250 ~V (47 - 63 Hz)

## S 1130 Quaternary Gradient Pump System

<b>Wetted Materials:</b>	PEEK, Teflon AF®, PVDF, Ceramics, Sapphire
<b>Flow Rate:</b>	Programmable Analytical: 0.001 - 10.000 ml/min
<b>Flow Accuracy:</b>	± 1.0 % 1.000 ml / min
<b>Flow Precision:</b>	± 0.1 % RSD 1.000 ml/min
<b>Pressure Range:</b>	0 – 40 MPa (0 – 6000 PSI)
<b>Pressure Pulsation:</b>	typical < 0.1 MPa or < 1.0 %
<b>Compressibility Compensation:</b>	user-adjustable for different solvents
<b>Vacuum Degassing:</b>	<i>optional:</i> < 20% dissolved gases remaining in water @ 1.000 ml/min
<b>Gradient Range:</b>	0.0 – 100.0 %, 4 channels
<b>Gradient Accuracy:</b>	< 0.50 %
<b>Gradient Mixing:</b>	Active
<b>Mixer Volume:</b>	adjustable: 100 – 500 µl
<b>Dimensions:</b> (W x H x D)	396 x 165 x 478 mm
<b>Power Supply:</b>	100 - 250 ~V (47 - 63 Hz)



# ORDER INFORMATION

## Ion Chromatography System S 150

Catalog No	Description
<b>S003695</b>	<b>Manual IC System S 151-M</b>
	- S 150 Ion Chromatography Module
	- with integrated Auto-Suppressor
	- S 1130 Isocratic Pump, PEEK, analytical
	- with integrated Vacuum Degasser
	- S 6120 Needle Injection Valve, 100 µl Sample Loop
	- Reagent Organizer S 600 w. 1x 1000ml Bottle

Catalog No	Description
<b>S004162</b>	<b>Manual IC System S 151-G</b>
	- S 150 Ion Chromatography Module
	- with integrated Auto-Suppressor
	- S 1130 Quaternary Gradient Pump, PEEK, analytical
	- with integrated 4-Channel Vacuum Degasser
	- S 6120 Needle Injection Valve, 100 µl Sample Loop
	- S 600 Reagent Organizer w. 4x 1000ml Bottles

Catalog No	Description
<b>S004070</b>	<b>Automatic IC System S 151-A</b>
	- S 150 Ion Chromatography Module
	- with integrated Auto-Suppressor
	- S 1130 Isocratic Pump, PEEK, analytical
	- with integrated Vacuum Degasser
	- S 5300 Sample Injector System, PEEK
	- S 600 Reagent Organizer w. 1x 1000ml Bottle

Catalog No	Description
<b>S004161</b>	<b>Automatic IC System S 151-AG</b>
	- S 150 Ion Chromatography Module
	- with integrated Auto-Suppressor
	- S 1130 Quaternary Gradient Pump, PEEK, analytical
	- with integrated 4-Channel Vacuum Degasser
	- S 5300 Sample Injector System, PEEK
	- S 600 Reagent Organizer w. 4x 1000ml Bottles

### System Options:

Catalog No	Description
S003582	Auto-Suppressor Module
S003583	Auto-Suppressor ENDURANCE update
S003585	S 150 Detector Dual Channel update
S003846	S 600 Reagent Organizer with Gas Regulator, 4x 1000 ml Bottles

### Separation Columns\*

Catalog No	Description
S003586	Anion Separation Column ION-A01 (2.6 x 150 mm)
S004193	Cation Separation Column ION-C01 (4.6 x 125 mm)

\* other columns are available on request

# SYKAM PRODUCTS

## S 500 Series HPLC Systems



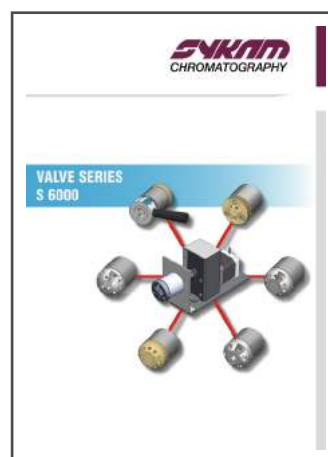
## S 600 Series HPLC Systems



## S 433 Amino Acid Analyzer



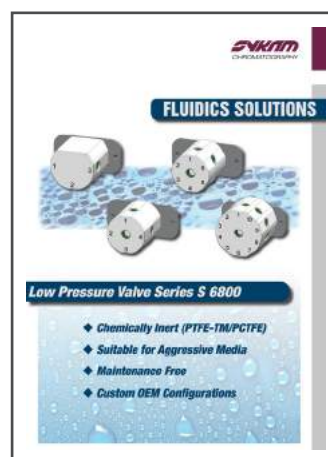
## S 6000 Valve Series



## Sykam OEM Modules



## S 6800 LP Valve Series



NOTES:

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