

# 838 Advanced IC Sample Processor



The 838 Advanced IC Sample Processor represents the latest generation of high-performance sample processors for ion chromatography. It sets new standards regarding flexibility, sample preparation, liquid handling and sample throughput. Sample volumes ranging from 500  $\mu\text{L}$  to 250 mL can be processed, 999 sample positions can be accessed; with up to three Dosinos, two membrane pumps and a bidirectional peristaltic pump the possibilities offered for liquid handling are virtually unlimited.

More than thirty years of experience in sample changer design – the first Metrohm sample changer was marketed in 1973 – guarantee the usefulness of our products. With the 838 Advanced IC Sample Processor, Metrohm now presents an instrument that is extremely user-friendly and allows substantial savings.

## Enjoy the weekend while the 838 works for you!

Automation in ion chromatography helps to optimally organize not only your working hours but also your spare time. There is no reason any more to waste time for routine work such as manual sample injection or manual sample preparation. The sample processor takes over all these tasks. The 838 Advanced IC Sample Processor's sample rack accommodates up to 148 samples. If we assume the analysis time for one sample to be 20 minutes, the sample processor will take care of these 148 samples over the weekend.

### «Human touch» or high precision?

In most cases, manual sample injection means increased standard deviation of the results. Systems equipped with Metrohm sample processors yield excellent reproducibilities. If the aim is to obtain highly accurate results and to automate and document all the sequences, the «High End» 838 Advanced IC Sample Processor is the instrument of choice.

Liquid handling with the built-in six-way injection valve and the bidirectional peristaltic pump.



## One system – numerous possibilities

The 838 Advanced IC Sample Processor comes in five versions. The application determines which sample processor is the right one.

### 838 Advanced IC Sample Processor (2.838.0010)

Equipped with a dual-channel peristaltic pump, the 838 Advanced IC Sample Processor acts as an automatic sampler for the IC system. The standard sample rack accommodates up to 148 samples and has three rinsing stations. Twelve further sample racks for different vessel sizes ranging from 2.5 mL to 250 mL are pre-programmed. Sealable sample vials with very small volumes (<0.5 mL) can also be used. Furthermore, it is possible to freely define sample racks and to access an external sample position, for example for urgent samples. The sample processor can be controlled as an independent instrument by means of an external keypad (option) or by the Metrodata IC Net software.

### Advanced IC Injection Sample Processor (2.838.0020)

This sample processor comes with an integral metal-free six-way injection valve that opens up a whole range of applications. The 838 can take over, for example, sample injection for the 817 Bioscan or supply the second valve for a combined anion-cation system. Within the framework of the Metrohm Inline Sample Preparation techniques, for example Inline Matrix Elimination, Inline Neutralization or Inline Calibration, the second valve is now readily available on the sample processor.

The dual-channel peristaltic pump can be used for various tasks such as sample injection or for conveying the transfer solution. Its velocity and flow direction can be perfectly adapted to the application at hand.

### Advanced IC Filtration Sample Processor (2.838.0210)

Sample filtration is a routine task in the analytical laboratory. Inorganic particles, humic acids, bacteria or algae are among the contaminants that have to be removed before the analysis as they are prone to block the separation column. One-way syringe filters are expensive and their application is problematic. Filter caps pushed into the sample vessel by the sample changer are obsolete, similarly expensive and limit the application range.

The solution today is ultrafiltration. The samples are placed onto the sample rack as usual and processed by the 838 Advanced IC Filtration Sample Processor. In the ultrafiltration cell the sample solution flows underneath a membrane on whose upper side the filtrate is aspirated off, transferred to the sample injection valve and finally injected. Sample transfer is performed by the built-in dual-channel peristaltic pump.

Ultrafiltration is ideal for samples with slight to medium contamination such as drinking water, surface water and waste water, digestion solutions and extracts, to mention just a few examples.

**Advanced IC Dialysis Sample Processor**  
(2.838.0110)

The Advanced IC Dialysis Sample Processor easily masters the unique Inline Dialysis sample preparation procedure patented by Metrohm. The dialysis cell is mounted vertically in the 820 Advanced IC Separation Center. A second valve is no longer required if another peristaltic pump (2.833.0010) is added to the setup.

Dialysis has significantly expanded the application range of ion chromatography. The diffusion-driven ion exchange through the semi-permeable and hydrophilic dialysis membrane made of cellulose acetate allows to analyze, without manual sample preparation and with high precision, even very difficult samples such as cutting oil emulsions, blood, urine, milk or beer.

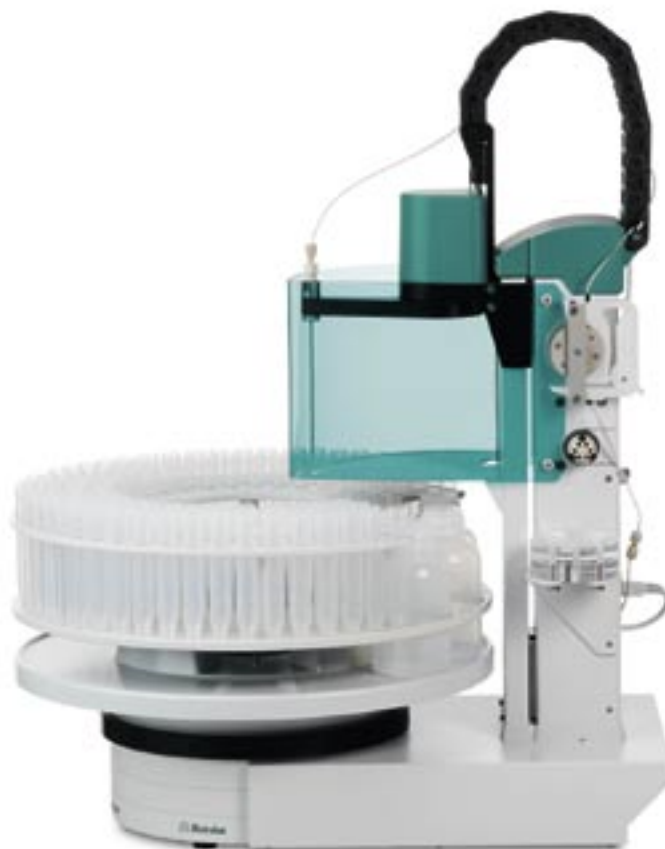
**Advanced IC Dilution Sample Processor**  
(2.838.0120)

Highly concentrated solutions often have to be diluted. The classical manual procedure is to dilute the sample before sample injection and above all before the sample is placed on the sample changer. Metrohm Inline Sample Dilution simplifies this step. The concentrated sample is placed into a vessel, all the rest is taken care of by the 838 Advanced IC Dilution Sample Processor fully automatically and with high precision. Different samples can be allocated different dilution factors that are automatically taken into account.

For the Inline Sample Dilution the 838 Advanced IC Dilution Sample Processor is supplemented with a Dosino and an external sample station with stirrer, where the dilution takes place. The built-in six-way injection valve is used for the different dilution and rinsing steps. The Dosino offers maximum flexibility together with high precision, which makes it possible to perform dilutions up to a factor of 1:500. The dual-channel peristaltic pump, whose rotation rate and flow direction can be varied, is used for the efficient rinsing of the sample station between samples. Carryover from one sample to the next is less than 0.5%.

**Applications**

- Anions in surface water samples after automatic Inline Ultrafiltration
- Anions and cations in industrial waste water samples by means of Inline Dialysis
- Analysis of carbohydrates with the 817 Bioscan PAD (pulsed amperometric detector)
- Anions in cutting oil emulsions after Inline Dialysis
- Cations in brine after automatic dilution
- Anions in blood and urine after Inline Dialysis
- Organic anions in champagne after Inline Ultrafiltration
- Anions in concentrated sodium hydroxide solution by means of Inline Neutralization
- Trace analysis of anions and cations in ultrapure water samples after Inline Sample Preconcentration of large volumes
- Rapid determination of phosphoric acid in cola drinks
- etc.



Lateral view of 838 Advanced IC Sample Processor.

**Technical specifications**

Exchangeable sample racks	yes
Automatic rack identification	yes
Sample volume (standard sample rack)	0.5...250 mL
Number of samples (standard sample rack)	12...148
Maximum number of samples (definable positions)	999
Swing Head connection	1
External position	1
RS 232C connection	yes
Remote connection	yes
MSB connections	3
Connection for 802/741 Stirrers	1
Connections for 801/804/802 Stirrers	3
Keypad with built-in intelligence	yes
Software-compatible (IC Net)	yes
Number of workstations	1
Integral dual-channel peristaltic pump	yes
– selectable rotational direction	yes
– variable velocity	yes
External pump connections (membrane pumps)	2
Integral six-way injection valve	yes
Sequences can be freely programmed via keypad	yes
Individual steps per sequence (3 sequences per method)	99
Method storage capacity of the instrument	approx. 100
Method storage capacity of the PC	unlimited
Splash protection	yes
800 Dosino	optional
801 Magnetic Stirrer	optional

## Ordering information

Order number	Sample processor
2.838.0010	838 Advanced IC Sample Processor <ul style="list-style-type: none"> <li>• Dual-channel peristaltic pump</li> </ul>
2.838.0020	838 Advanced IC Injection Sample Processor <ul style="list-style-type: none"> <li>• Dual-channel peristaltic pump</li> <li>• Six-way injection valve</li> </ul>
2.838.0110	838 Advanced IC Dialysis Sample Processor <ul style="list-style-type: none"> <li>• Dual-channel peristaltic pump</li> <li>• Dialysis cell</li> </ul>
2.838.0120	838 Advanced IC Dilution Sample Processor <ul style="list-style-type: none"> <li>• Dual-channel peristaltic pump</li> <li>• Six-way injection valve</li> </ul> <i>800 Dosino and 801 Magnetic Stirrer to be ordered separately.</i>
2.838.0210	838 Advanced IC Filtration Sample Processor <ul style="list-style-type: none"> <li>• Dual-channel peristaltic pump</li> <li>• Ultrafiltration cell</li> </ul>
	<i>Keypad and sample rack to be ordered separately.</i>
6.2142.050	<b>Keypad</b>
	<b>Sample racks</b>
6.2041.440	Standard sample rack 148 x 11 mL + 3 x 300 mL
6.2041.430	Sample rack 127 x 11 mL + 2 x 300 mL
6.2041.750	Sample rack 36 x 11 mL
6.2041.310	Sample rack 12 x 250 mL
6.2041.320	Sample rack 16 x 150 mL
6.2041.340	Sample rack 24 x 75 mL
6.2041.350	Sample rack 48 x 75 mL
6.2041.360	Sample rack 12 x 150 mL
6.2041.370	Sample rack 14 x 200 mL
6.2041.380	Sample rack 14 x 8 oz
6.2041.390	Sample rack 16 x 120 mL
6.2041.400	Sample rack 126 x 15 mL + 2 x 250 mL
6.2041.410	Sample rack 141 x 15 mL+ 1 x 500 mL
	<b>Sample vessels</b>
6.2743.050	PP sample vessels (11 mL); 2000 pieces
6.2743.040	PP sample vessels (2.5 mL); 2000 pieces
6.2743.070	PP stopper with perforation for sealing the sample vessels; 2000 pieces
	<b>Membranes</b>
6.2714.020	Filter membrane made of regenerated cellulose, 50 pieces
6.2714.010	Dialysis membrane made of cellulose acetate, 50 pieces



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