

# IC-D3150

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## ION CHROMATOGRAPHY SYSTEM



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

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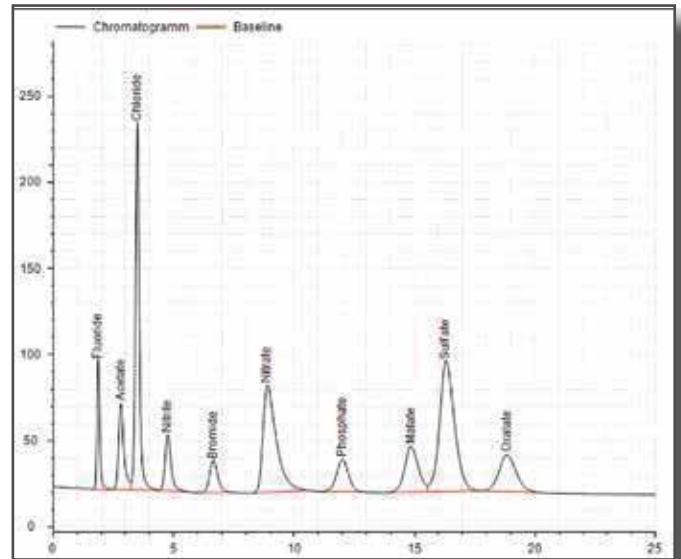
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➤ ANION & CATION ANALYSIS

➤ WATER ANALYSIS

➤ ENVIRONMENTAL ANALYSIS

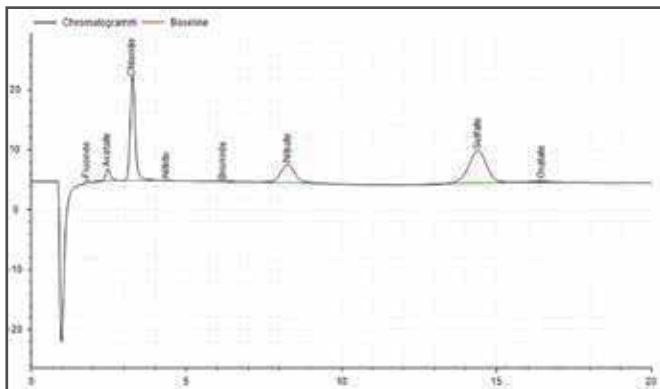
➤ ION CHROMATOGRAPHY



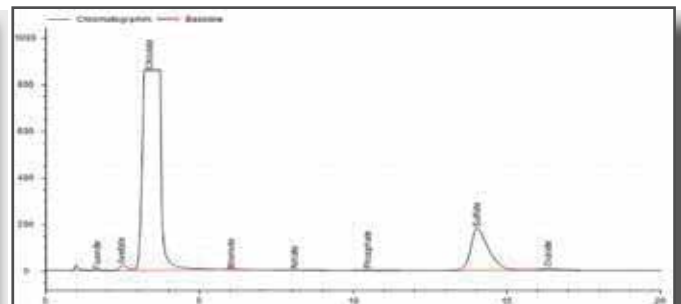
Extended Water Application (Anions)

➤ IC APPLICATIONS

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. Online degassing facility available in IC-D3150



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

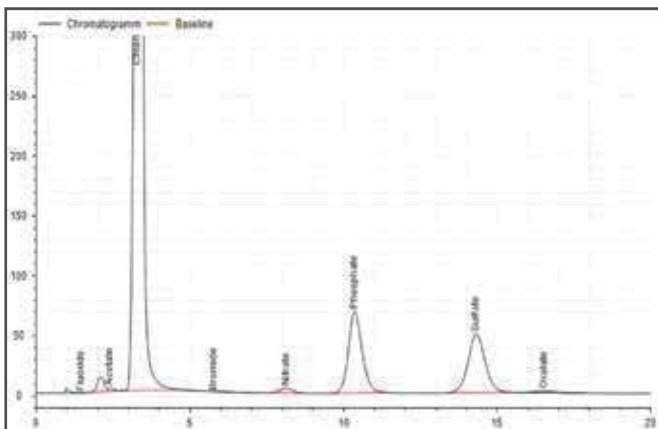
- Drinking water
- Tap water
- Sea water
- Waste water
- Rain water
- Ultra-trace determination in electronic and power plants
- Quality control and analysis of impurities
- Elemental analysis (Wickbold & Schoeningner)
- Pharmaceuticals
- Urine analysis



Water analysis for water treatment plants



Cooling water control for power plants



Urine (Anions)



Ground water analysis for quality control

## ►► ION CHROMATOGRAPHY SYSTEM IC-D3150

### Automatic IC System IC-D3150

The Automatic Ion Chromatograph IC-D3150 is a modular system which can be customized to any application needs.

#### IC-D3150 Pump System

The ATL HPLC Pump System is a very flexible and powerful HPLC solvent delivery system. The possible configurations include an Binary or Quaternary Gradient Pump.

#### IC-D3150 Sample Injector

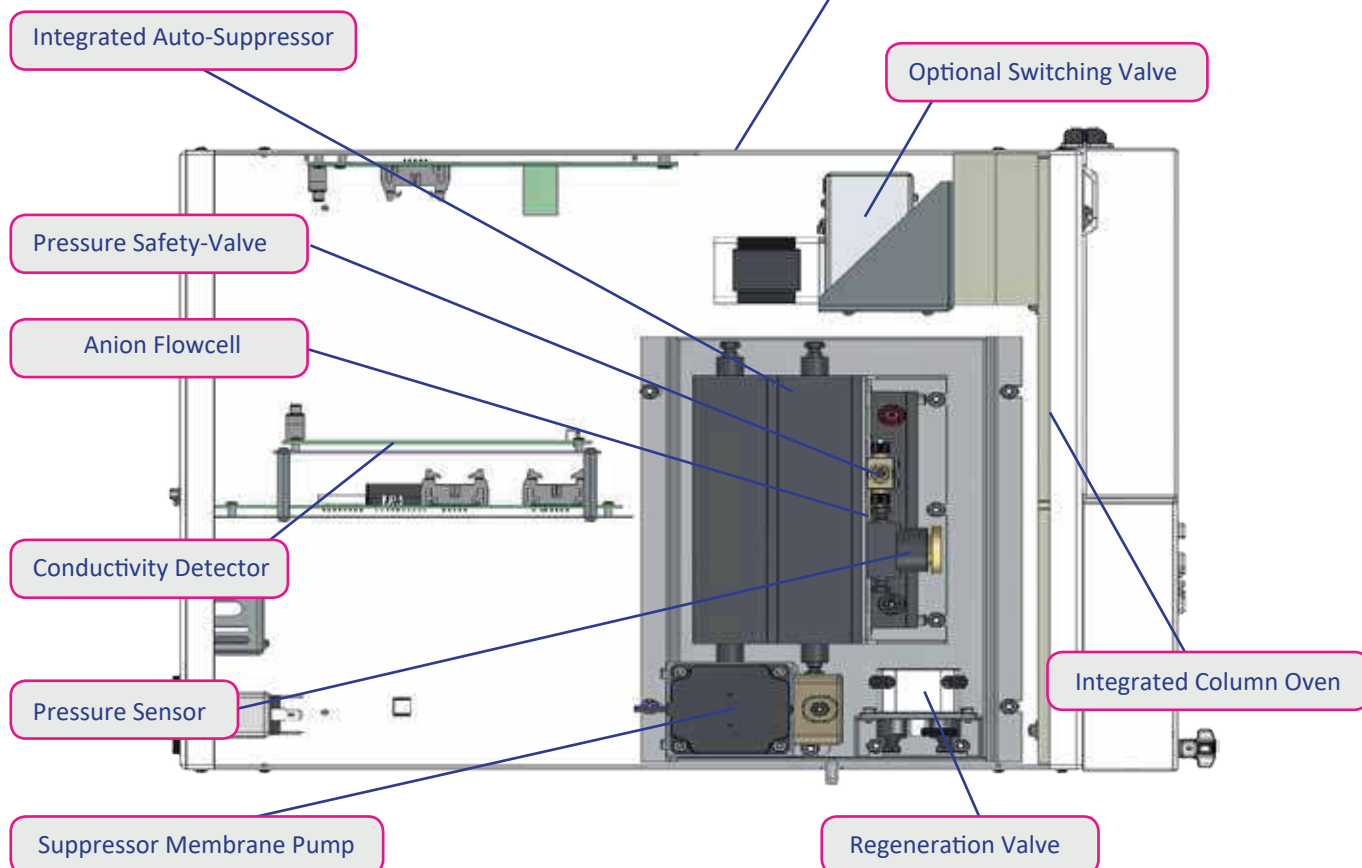
The ATL Sample Injector System is a reliable and accurate HPLC autosampler with excellent reproducibility and linearity properties. Variable vial racks and adaptors for microtiter plates as well as a multitude of options make this system highly adaptable and suitable for any analytical application.



## ►► Manual IC System IC-D3150

The Manual Ion Chromatograph IC-D3150 is a low-cost modular system for low sample through put.

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



## ►► AUTO-SUPPRESSOR

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

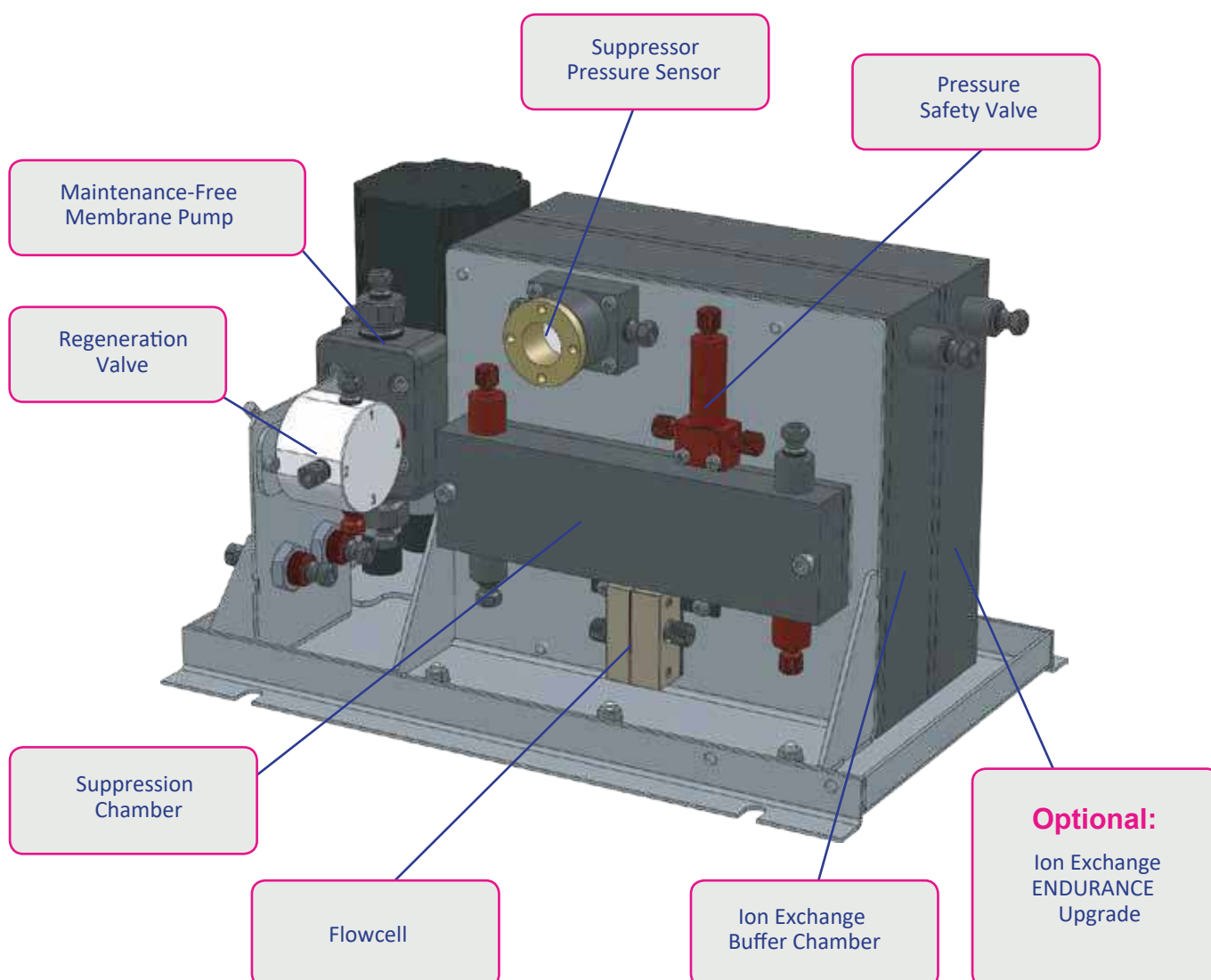
operation and the proper function is monitored by a built-in pressure sensor.

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

Easily regenerated without effort and need not to be replaced.

### Trouble-Free Operation

The ATL 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 When the chamber's capacity is reached it can be



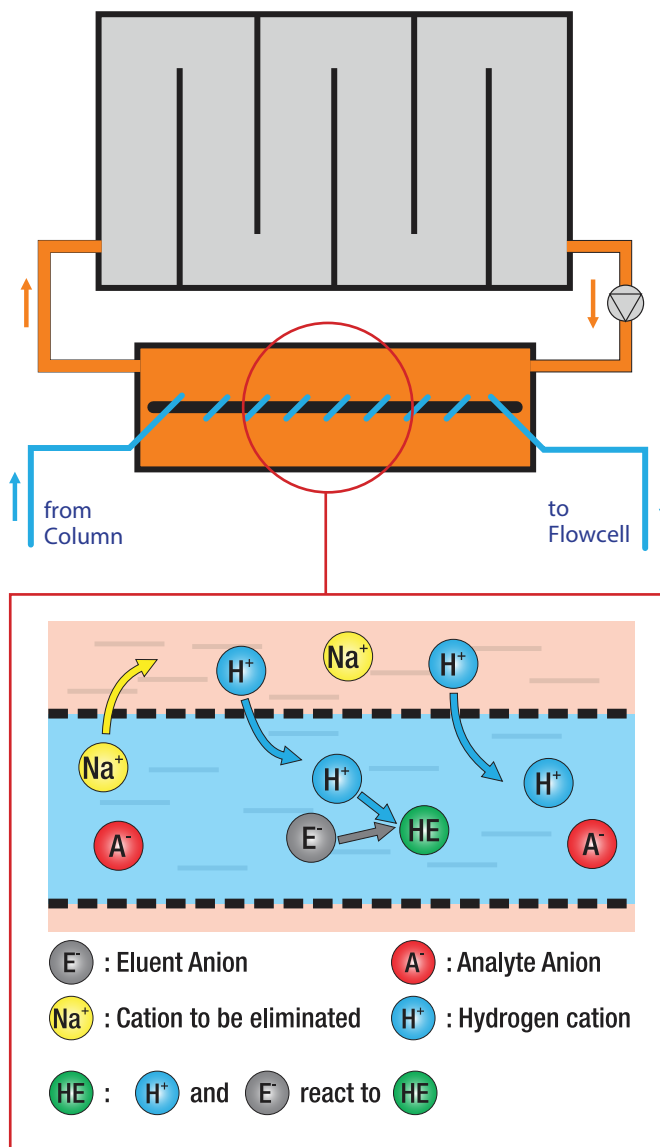
## ►► Working Principle

The ATL Auto-Suppressor substitutes counter cations of the eluent (e.g.  $\text{Na}^+$ ) with hydrogen ions. This transfers the eluent anion (e.g.  $\text{CO}$  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 ATL 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
- Post Column derivatization unit for derivatization of transition metals with peristaltic pump mixing T & Tubing.



### Columns

- With smaller particle size packing
- Column available for analysis of cations, anions and transition metals.
- Facilitated with column identification chip for storage of data related to column constitution etc.
- Capacity to attend upto 3000 injections and its data storage.
- Available with column heaters and guard column.



## ►► TECHNICAL SPECIFICATIONS

### IC-D3150 Ion Chromatography Module

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

<sup>1</sup>Flowcell only

### Column Oven

Temperature Range:	+30°C to +100°C1
Temperature Accuracy:	< 0.1 °C
Switching Valve:	optional: any D3000Series Valve
Temp stability:	± 0.5 °C

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

### Injector - Two numbers

cap	Dual 6 port injector valve with fast response time and controlled through software along with degasser for samples.
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### IC-D3150 Sample Injector System

Wetted Materials:	PEEK, PPS, PVDF
Sample Capacity:	120 (1.5 ml), 192 (microtiter plates)
Injection Volume:	Programmable 0.1mL to 5.0mL
Sample Heating/Cooling:	optional: +4 to +60 °C
Injection Precision:	< 0.5 % Variable Volume Injection (10 µl; typically ~0.25 %)
Linearity:	Correlation Factor > 0.999 (10 µl injection volume, 500 µl Syringe)
Position:	Minimum 100 positions
Vial size:	0.5mL and 10mL or higher
Carry Over:	< 0.05 % with wash program
Dimensions: (W x H x D)	396 x 275 x 478 mm
Power Supply:	100 - 250 ~V (47 - 63 Hz)

Dual position 6-port injector valve with fast response time and controlled through software. with 20micron filter located in the vial

### IC-D3150 Pump

Wetted Materials:	Metal free, PEEK, Teflon AF®, PVDF, Ceramics, Sapphire
Flow Rate:	Programmable (microprocessor based) Analytical: 0.001 - 10.000 ml/min in 0.001 mL/min increments
Flow Accuracy:	± 0.1 % 1.000 ml / min
Flow Precision:	± 0.1 % RSD 1.000 ml/min
Pressure Range:	0 - 40 MPa (0 – 6000 PSI)
Pressure pulsation	typical < 0.1 MPa or < 1.0 % lower than 1%
Flow increment:	0.001mL/min
Compressibility	user-adjustable for different solvents
Compensation:	
Vacuum Degassing:	optional: < 20% dissolved gases remaining in water @ 1.000 ml/min
Dimensions: (W x H x D)	396 x 165 x 478 mm
Power Supply:	100 - 250 ~V (47 - 63 Hz)
flow reproducibility	+0.1%
Resolution of flow rate	0.001mL
Leak :	Inbuilt leak detector
USB Communication :	Yes
Upgrade:	upgradable to binary/tenary gradient
Pressure Ripple	<1% at 1.0mL/min

### Conductivity Detector

Type :	Microprocessor controlled digital signal processor
Cell drive :	8 KHz square wave
Linearity :	1%
Output ranges :	Digital signal range:0-15000 µS
Analog signal range :	0-15000 µS
Measuring Range:	0 nS/cm at to 20,000 µS/cm
Flowcell Volume:	0.7µl
Electroni noise:	<0.1 nS/cm at 1 µS/cm level (conductivity 0-150µS/cm) ±2.0 nS/cm at 1 µS/cm level (conductivity 151-3200µS/cm)
Temperature coefficient range:	0-5%
Temperature stability :	<0.001°C
Filter :	rise times 0 to 10s, user selectable
Drift:	<0.1nS/cm per hour
Cell Temperature stability:	<0.001°C
Temperature range :	20-50°C (ambient: +7°C)
Resolution:	0.001ns/cm
Cell electrodes :	stainless steel
Cell body :	Chemically inert polymer
Maximum cell operating pressure:	1500 Psi
Sampling Rate	1 to 100Hz automatic

## PDA Detector

Wavelength range:	190-800nm
Wavelength accuracy:	+/- 3nm
Absorption range:	-2.0 to +/-2.0 abs
Bandwidth:	1-10nm
Channels:	Minimum six measuring channel and one reference channel
No. of Diodes:	Minimum 512

## Pressure alarm limit:

Upper limit :	0-5800 PSI one unit increment
Lower Limit :	Settable to one unit lower than the upper limit.
Eluent on-off valve :	standard
Vacuum degas :	Yes
Eluent bottles :	Polypropylene
Injection valve:	6-port, 2-position Rheodyne valve, electrically activated
Column length :	250 mm analytical column with 50 mm guard column

## Auto-Suppressor

Pump System:	Membrane Pump
Safety Systems:	- Pressure Sensor - Pressure Valve
Back-pressure:	310psi
Chemical suppression:	2mm and 4mm anion and cation
Displacement chemical regression:	2mm and 4mm anion and cation
Electrolytic suppression:	self regenerating: 2 mm and 4 mm anion and cation with external water mode.

## Environmental Factors:

Ambient Temperature range:	5-40°C
Humidity Range :	5-90%

## ►► IC-D3150 UV-Visible Detector

Wetted Materials:	Stainless Steel / PEEK*
Baseline Noise:	$\pm 0.25 \times 10^{-4}$ AU (@240 nm, 2 sec Risetime)
Baseline Drift:	$< 1 \times 10^{-4}$ AU/h
Wavelength Range:	190 – 900 nm
Wavelength Accuracy:	$\pm 1$ nm
Linearity:	$> 2.0$ AU
Light Source	Deuterium Lamp , Tungsten Lamp
Wavelength Program:	Programmable , 10 steps
Analog Output:	1x 1 V ( optional : 2x 1V)
Control Features:	Internal Peak Detector with +24 V solenoid switching output.
Dimensions:	396 x 165 x 478 mm
(W x H x D)	
Power Supply:	100 - 250 ~V (47 - 63 Hz)
Data Collection rate	100Hz

## IC-D3150 Electrochemical Detector

### ►► Features:

- Quantify femtogram levels of oxidizable or reducible compound
- Automatic detection parameters configuration
- Four independent controlled channels
- Advanced multi-level digital filtering
- Detection control via USB 2.0/optical/RS-232
- Fluid leakage detection
- Multiple Detection modes: direct current, pulsed amperometric and scanning
- Flow cell convenient position for simple cleaning and assembly
- Stabilized temperature for better accuracy with integral flow cell
- Cell assembly/detection unit enclosed in a faraday cage.
- Cell volume at Working Electrode: <0.2 $\mu$ L

### ►► Technical Specification

Principle : Amperometric detector with free-electrode technique.

Working Potential	$\pm 2.00$ V	Storage capacity for	
Measurement Range	$\pm (10\text{pA}-20\text{uA})$	measurement program	0 - 99
Auto Zero Range	max $\pm 50\text{uA}$	Storage capacity for cell-cleaning	
Manual offset Range	max $\pm 50\text{uA}$	program	0 - 99
LCD - Display	display of setting and measurement data	Analogram Output	+ 1V per measurement
Filter	5Hz - 0.02 Hz (0.2 - 50 sec)	Signal range	10pA to 500 $\mu$ A
Detector noise level	<0.3 pA	Auto-Zero interface	active low
Cleaing Potential	$\pm 2.00$ V	Input	115-320v, 50-60Hz
Detay time cleaning	10 - 1500sec	Output	12 V DC, 205 A
Cleaning Cycle	every 1st to 10th cycle	Dimensions	260 x 251 x 160 mm
DC Current	10nA -200 $\mu$ A in 1-2-5 Sequence.	Weight	7.6 kg

## HPLC Servicing, Validation, Trainings and Preventive Maintenance :

**HPLC Servicing** :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

**Trainings** :We also take up preventive Maintenance to reduce downtime of HPLC's Trainings.

**AMC's/CMC** :AMC's/CMC :We offer user training both in-House and at customer sites on HPLC principles, operations, trouble-shooting.

**Validations** :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.

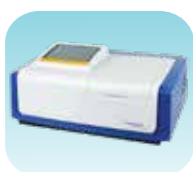
**Instruments** :Instruments :We offer instruments/Renting Services Modules like pumps,detector etc. on Rent.



## About Analytical Technologies

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Analyzer



Laser Particle  
Size Analyzer



Ion Chromatograph



Water purification  
system

## Regulatory compliances



## Corporate Social Responsibility

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:



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2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXIFY human minds, souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

## Reach us @



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