

# NEW ELSD 2000ES

E N H A N C E D   S E N S I T I V I T Y

**More Sensitive** — Lower detection limits

**Two Operating Modes** — Get optimum performance for all applications

**Universal** — Detect compounds missed by other detectors

**Advanced Features** — Increase productivity and decrease downtime

**Low Temperature Operation** — Detect semi-volatile compounds



The Most Advanced  
**ELSD**  
Is Now Even **MORE**  
**SENSITIVE**

**Alltech** Specialists in Chromatography

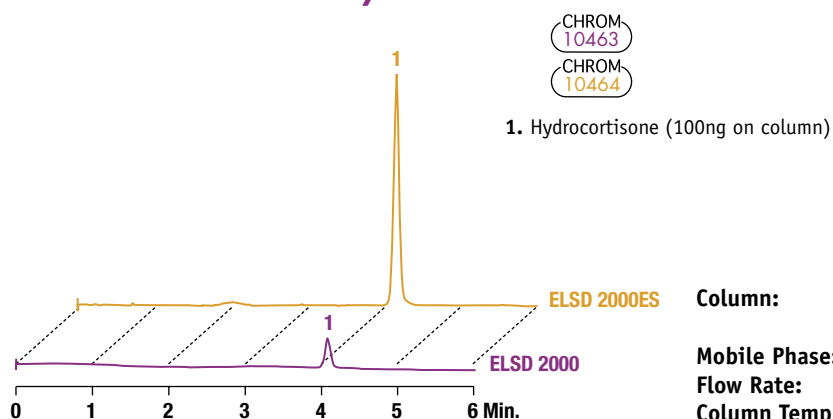
Brochure #497

# FROM THE LEADER IN EVAPORATIVE LIGHT SCATTERING DETECTION

## The Most Advanced ELSD Is Now Even More Sensitive

The ELSD 2000ES has all the benefits of the ELSD 2000 plus even greater sensitivity! The optical and electronic components have been redesigned to minimize background noise and increase sensitivity. The result of this new, patent pending technology is lower detection limits and greater signal-to-noise ratios.

### The ELSD 2000ES Increases Sensitivity for Equal Concentrations of Hydrocortisone



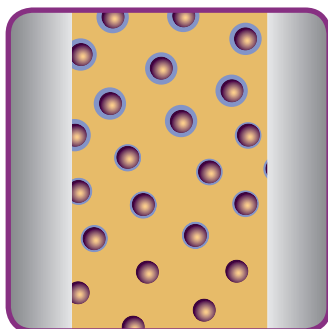
**Column:** Alltima™ C18, 5µm, 250 x 4.6mm (Part No. **88056**)  
**Mobile Phase:** Water:Acetonitrile (55:45)  
**Flow Rate:** 1.0mL/min  
**Column Temp:** Ambient

## Evaporative Light Scattering Detection in Three Simple Steps



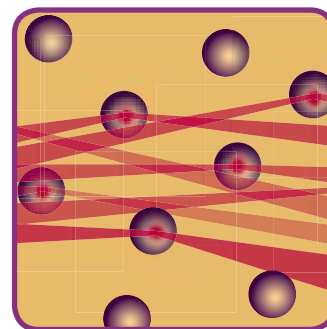
### 1. Nebulization

Column effluent passes through a needle and mixes with nitrogen gas to form a dispersion of droplets.



### 2. Evaporation

Droplets pass through a heated 'drift tube' where the mobile phase evaporates, leaving a fine mist of dried sample particles in solvent vapor.

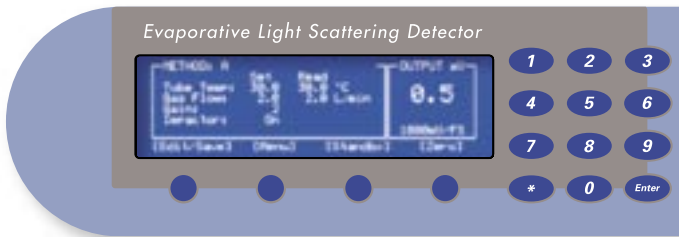


### 3. Detection

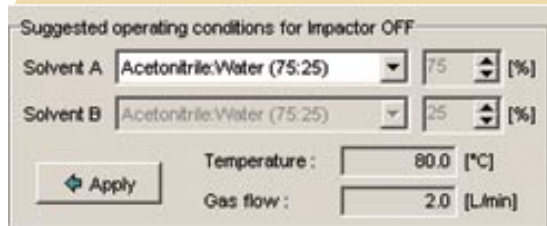
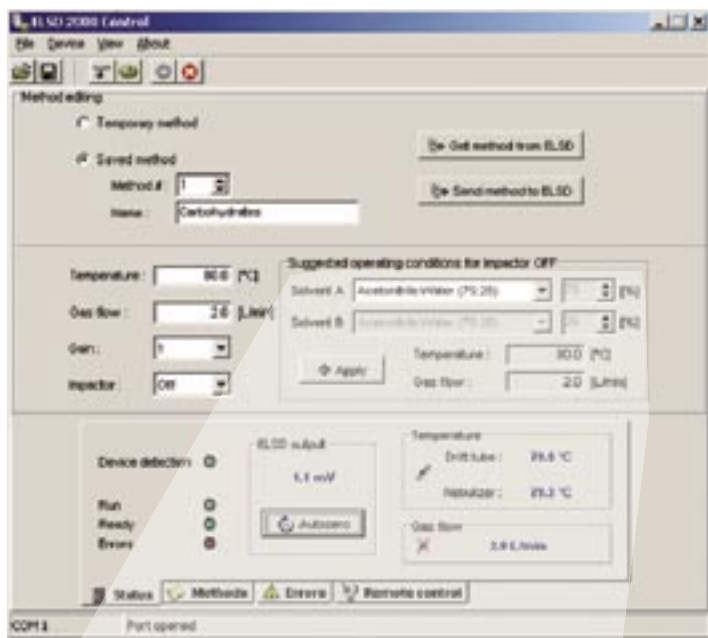
The sample particles pass through a cell and scatter light from a laser beam. The scattered light is detected, generating a signal.

# ADVANCED INSTRUMENT CONTROL

The ELSD 2000ES has many features that enhance detector performance, increase productivity, and decrease downtime



Program and view method parameters on the ELSD's menu-driven front panel. Store as many as 10 methods.



Comprehensive PC-based control software makes choosing the critical operating parameters of temperature and gas flow a snap.

## Digital Gas Flow Control

Digital gas flow control ensures reproducible results. Changing gas flow is fast and easy from the ELSD's front panel or PC control software. Save gas by automatically shutting off gas flow at the end of an unattended run.

## Onboard Diagnostics

Decrease downtime with automated troubleshooting, or use diagnostic tests to verify detector functions on start-up.

## Safe, Unattended Operation

Alarm set points ensure tight control of the critical operating parameters. When operating unattended, an output signal can trigger the LC pump to shut down under alarm conditions. Deviations in operating parameters are logged by the type of error at the time it occurs.

## ELSD 2000ES\* Specifications

<b>Light Source:</b>	Laser diode with collimating optics, 650nm, 30mW output, class IIIB
<b>Detector Element:</b>	Silicon photodiode
<b>Temperature Range:</b>	Ambient to 120°C in 1°C increments
<b>Nebulizer Gas:</b>	Nitrogen preferred; Calibrated to 4.0L/min
<b>Inlet Pressure:</b>	60-80psig
<b>Typical Operating Range:</b>	1.0-3.0L/min
<b>Flow Control:</b>	Digital mass flow control
<b>Mobile Phase Flow Rate:</b>	To 5.0mL/min
<b>Analog Output:</b>	1V or 10mV full scale
<b>Communications:</b>	Inputs: TTL/contact closure for auto zero and gas shutoff Outputs: Contact closure for pump shutdown in error conditions
<b>User Interface:</b>	Graphical LCD with alphanumeric keypad and/or Windows® based PC control via serial I/O
<b>Power Requirements:</b>	120/240V, 50/60Hz
<b>Dimensions:</b>	23.0" H x 12.5" W x 21.6" D (58.4cm H x 31.8cm W x 54.8cm D)
<b>Weight:</b>	35lbs (16Kg)
<b>IEC/FDA Classification:</b>	Class 1 laser product
<b>Warranty:</b>	1 year parts and labor

\*Patent pending

# OPTIMUM PERFORMANCE WITH ANY APPLICATION

## Why Two Operating Modes?

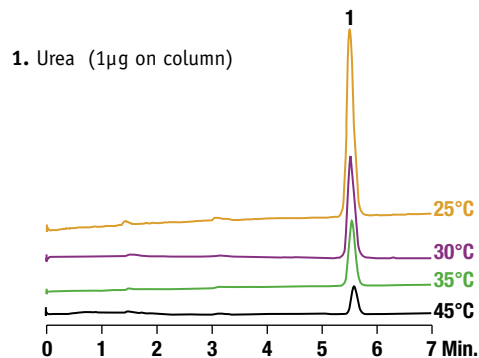
- **Splitting** – Best for semi-volatiles at low temperatures
- **Not Splitting** – Best for non-volatiles at high temperatures

Since an ELSD's response is based on the amount of particles passing through the optical cell, it makes sense that sending 100% of the column effluent would net the highest responses. In most, but not all cases, this is true. Some samples such as semi-volatiles may benefit from lower operating temperatures and gas flows achieved by splitting a portion of the aerosol stream to waste. Only the ELSD 2000ES offers the choice of splitting or not splitting, giving you optimum sensitivity for every application.

### Splitting Allows Near Ambient Temperature Evaporation, Maximizing Sensitivity for Semi-Volatiles

Low Temperature Analysis of Urea

CHROM 10307

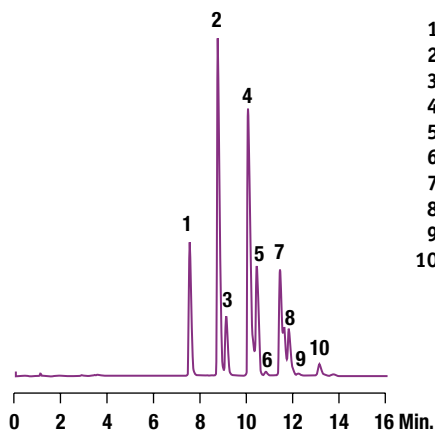


**Column:** Prevail™ Carbohydrate ES, 5µm, 250 x 4.6mm (Part No. 35101)  
**Mobile Phase:** Acetonitrile:Water (85:15)  
**Flow Rate:** 1.0mL/min  
**Column Temp:** Ambient

### Not Splitting is Best for Non-Volatile Samples and/or Organic Mobile Phases

Triglycerides in Sesame Seed Oil

CHROM 9517



1. LLL
2. LLO
3. LLP
4. OOL
5. POL
6. PPL
7. OOO
8. OOP
9. PPO
10. OOS

**Column:** Alltima™ C18, 3µm, 150 x 4.6mm (Part No. 91387)  
**Mobile Phase:** A: Dichloromethane B: Acetonitrile  
**Gradient:**

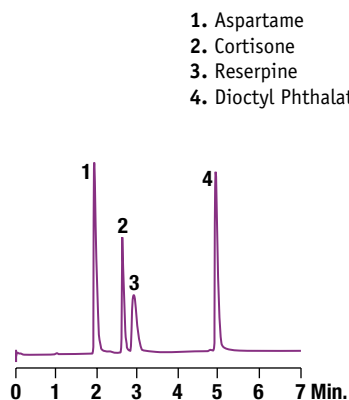
Time:	0	10	18	20
%B:	70	55	70	70

  
**Flow Rate:** 1.5mL/min  
**Column Temp:** Ambient

### Splitting Maintains Stable Baselines with Rapid, Extreme Gradients

LC/MS Screening Performance Test Mix

CHROM 10273



1. Aspartame
2. Cortisone
3. Reserpine
4. Diocetyl Phthalate

**Column:** Platinum™ C18, 3µm, 20 x 4.6mm (Part No. 43804)  
**Mobile Phase:** A: 0.05% Formic Acid in Water B: 0.05% Formic Acid in Acetonitrile  
**Gradient:**

Time:	0	3	7	10
%B:	5	90	90	5

  
**Flow Rate:** 1.0mL/min  
**Column Temp:** 40°C

# E L S D 2 0 0 0 E S

## REPLACE OR COMPLEMENT YOUR EXISTING DETECTOR

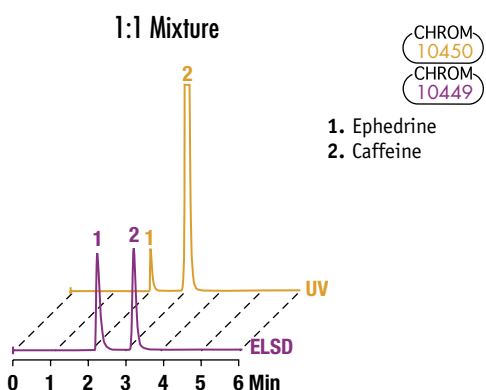
### ELSD Advantages Compared to Other LC Detectors

	ELSD	RI	UV	MS
<b>Sensitivity</b>	●	○	●	●
<b>Gradient Capability</b>	●	○	○	●
<b>Baseline Stability</b>	●	○	○	●
<b>Solvent Interference</b>	●	○	○	●
<b>Mass Balance</b>	●	●	○	○

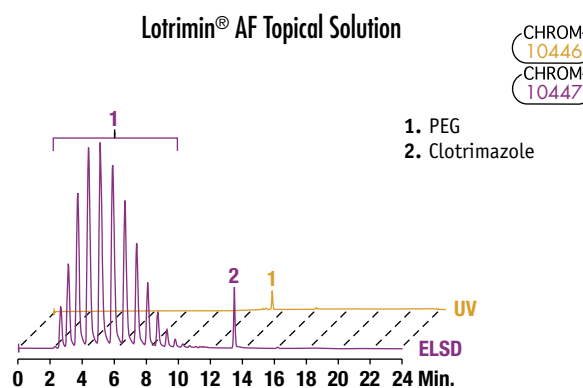
Chart Key	
<b>Excellent:</b>	●
<b>Good:</b>	◐
<b>Poor:</b>	○

#### ELSD Obtains a More Accurate Representation of Sample Mass than UV



**Column:** Alltima™ HP EPS C18, 5µm, 150 x 4.6mm (Part No. 87715)  
**Mobile Phase:** 1% Acetic Acid:Methanol:Acetonitrile (70:20:10)  
**Flow Rate:** 1.0mL/min  
**Column Temp:** Ambient

#### ELSD Shows What May Be Missing From Your UV Chromatogram

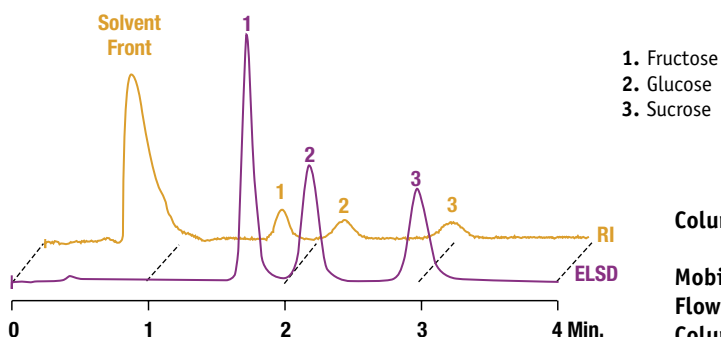


**Column:** Alltima™ C18, 5µm, 150 x 4.6mm (Part No. 88302)  
**Mobile Phase:** A: Water B: Methanol  
**Gradient:**

Time	0	8	10	20	25
%B	30	50	100	100	30

**Flow Rate:** 1.0mL/min  
**Column Temp:** 40°C

#### ELSD Replaces RI with Higher Sensitivity and Stable Baselines

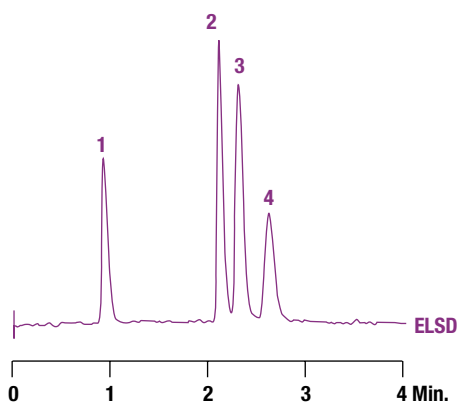
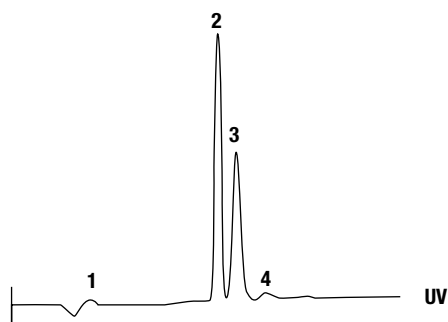
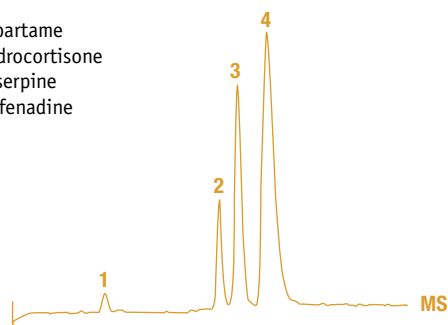


**Column:** Prevail™ Carbohydrate ES, 5µm, 53 x 7mm Rocket™ (Part No. 35104)  
**Mobile Phase:** Acetonitrile:Water (75:25)  
**Flow Rate:** 2.0mL/min  
**Column Temp:** 30°C

# IDEAL FOR PHARMACEUTICAL AND NUTRACEUTICAL ANALYSIS

## Use ELSD In Parallel with UV/Vis and MS for Maximum Structural and Concentration Information

1. Aspartame
2. Hydrocortisone
3. Reserpine
4. Terfenadine



CHROM-10456

CHROM-10458

CHROM-10457

**Column:** ZORBAX® StableBond C18, 3.5µm, 50 x 4.6mm (Part No. 835975-902)  
**Mobile Phase:** A: 0.025% Formic Acid in Water  
 B: 0.025% Formic Acid in Acetonitrile  
**Gradient:**

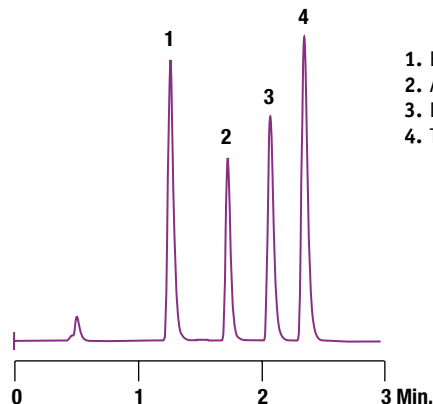
Time:	0.0	1.0	5.0	5.1
%B:	25	70	70	25

  
**Flow Rate:** 1.0mL/min  
**Column Temp:** 30°C

Chromatograms courtesy of Agilent Technologies

## Stable Baselines with Rapid, Extreme Gradients

1. Ephedrine
2. Acetylsalicylic Acid
3. Diphenhydramine
4. Trimipramine



CHROM-10451

**Column:** Alltima™ HP C18, 3µm, 33 x 7mm Rocket™ (Part No. 87671)  
**Mobile Phase:** A: 0.1% TFA in Water B: 0.1% TFA in Acetonitrile  
**Gradient:**

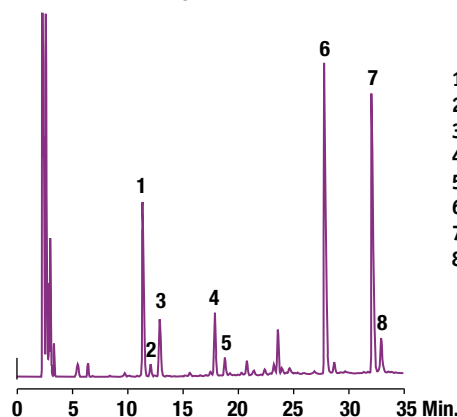
Time:	0	3
%B:	10	90

  
**Flow Rate:** 2.5mL/min  
**Column Temp:** 30°C

## Use Gradient Elution and Detect Non-Chromophoric Nutraceuticals

### Ginkgo Biloba Standardized Extract

1. Bilobalide
2. Ginkgolide J
3. Ginkgolide C
4. Ginkgolide A
5. Ginkgolide B
6. Quercetin
7. Kaempferol
8. Isorhamnetin



CHROM-10241

**Column:** Alltima™ C18, 5µm, 250 x 4.6mm (Part No. 88056)  
**Mobile Phase:** A: 0.05% TFA in Water:Methanol (95:5)  
 B: 0.05% TFA in Methanol  
**Gradient:**

Time:	0	35
%B:	25	75

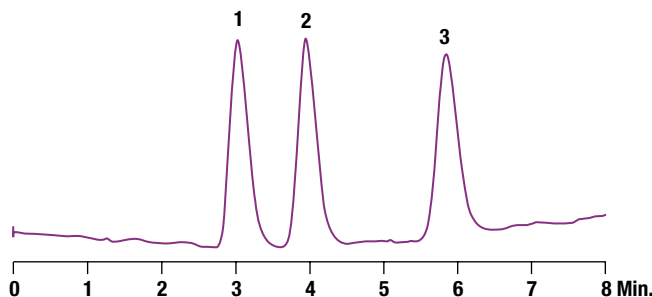
  
**Flow Rate:** 1.0mL/min  
**Column Temp:** Ambient

# VERSATILE DETECTION FOR A BROAD RANGE OF APPLICATIONS

## Use ELSD with Microbore Columns without Modifying the Detector

### Glucopyranosides

CHROM 10310



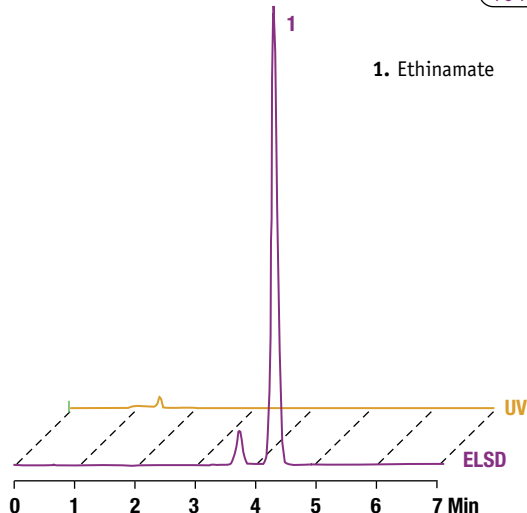
1. n-Octyl Glucopyranoside (50ng on column)
2. n-Decyl Glucopyranoside (50ng on column)
3. n-Dodecyl Glucopyranoside (50ng on column)

**Column:** Alltima™ C18, 3µm, 150 x 1mm (Part No. 43864)  
**Mobile Phase:** Methanol:Water (90:10)  
**Flow Rate:** 50µL/min  
**Column Temp:** Ambient

## Use ELSD for Triggering Fraction Collection of UV/Vis Transparent Compounds in Preparative Applications

### Ethinamate

CHROM 10438



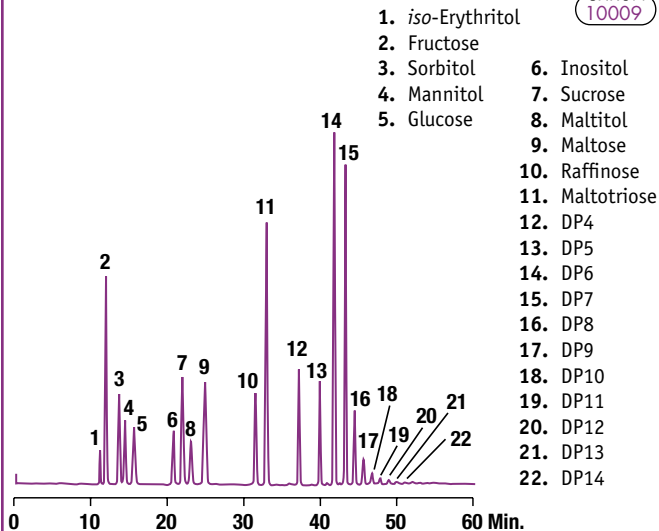
1. Ethinamate

**Column:** Alltima™ C18, 5µm, 150 x 10mm (Part No. 81102)  
**Mobile Phase:** Water:Acetonitrile (55:45)  
**Flow Rate:** 5.0mL/min  
**Column Temp:** 25°C

## ELSD Simplifies Detection of Difficult Samples

### Mono-, Di-, Tri-Saccharides

CHROM 10009



1. iso-Erythritol
2. Fructose
3. Sorbitol
4. Mannitol
5. Glucose
6. Inositol
7. Sucrose
8. Maltitol
9. Maltose
10. Raffinose
11. Maltotriose
12. DP4
13. DP5
14. DP6
15. DP7
16. DP8
17. DP9
18. DP10
19. DP11
20. DP12
21. DP13
22. DP14

**Column:** Prevail™ Carbohydrate ES, 5µm, 250 x 4.6mm (Part No. 35101)  
**Mobile Phase:** A: Acetonitrile  
 B: 0.04% Ammonium Hydroxide in Water  
**Gradient:**

Time:	0	25	40	60
%B:	17	27	45	55

**Flow Rate:** 1.0mL/min  
**Column Temp:** Ambient

# PRODUCT DETAILS AND SERVICES



The ELSD 2000ES has been designed and manufactured in accordance with the following standards: EN6101-1 + A2:95, EN555011: 1998, FCC CFR 47 Part 15: 2001, EN 61326: 1998, EN 6100-3-2: 1995 + A14:2000 and EN61000-3-3: 1995

## ELSD 2000ES\*

DESCRIPTION	PART No.
120V	<b>600100ES</b>
240V	<b>600200ES</b>

\* Patent Pending

## Full IQ/OQ/PQ Protocols Included With Each ELSD

Alltech makes it easy for you to integrate the ELSD into a qualified HPLC system. The ELSD 2000ES is thoroughly tested before shipment and calibration and performance documents are included with each instrument. Detailed IQ/OQ/PQ procedures are included with the detector to help you perform your own qualification. We also provide the option of onsite qualification performed by an Alltech service engineer.

## Instrument Services

DESCRIPTION	PART No.
<b>Qualification Services</b>	
IQ/OQ performed by Alltech	<b>Q60010ES</b>
PQ performed by Alltech	<b>Q60020ES</b>
IQ/OQ/PQ performed by Alltech	<b>Q60030ES</b>
Re-OQ performed by Alltech	<b>Q60040ES</b>
Re-OQ/PQ performed by Alltech	<b>Q60050ES</b>
<b>Installation and Training</b>	
Installation and familiarization	<b>INSTALL</b>



**Experience the benefits of increased sensitivity today!**

**Call and ask for a quote or information on sample analysis or a product demonstration in your lab.**

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